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WHEAT FLOUR MILLING INDUSTRY

COMMUNICATION

FROM

THE CHAIRMAN OF THE FEDERAL TRADE COMMISSION

TRANSMITTING

THE REPORT OF THE COMMISSION ON THE WHEAT FLOUR MILLING INDUSTRY

IN RESPONSE TO SENATE RESOLUTION NO. 212, SIXTY-SEVENTH CONGRESS, SECOND SESSION AGREED TO JANUARY 18, 1922

MAY 14 (calendar day, MAY 16), 1924.—Ordered to lie on the table

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

SUBMITTED BY MR. NORRIS

IN THE SENATE OF THE UNITED STATES,
June 3, 1924.

Ordered, That the report of the Federal Trade Commission, relative to wheat-flour milling industry, transmitted to the Senate on May 16, 1924, in response to Senate resolution 212 (agreed to January 18, 1922, Sixty-seventh Congress, second session), be printed as a Senate document with illustrations.

Attest:

GEORGE A. SANDERSON, *Secretary.*

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ACKNOWLEDGMENT

The commission desires to mention as especially contributing to the preparation of this report Messrs. W. H. England, T. A. Carroll, C. G. Farwell, J. B. Peat, and H. H. Moore.

LETTER OF SUBMITTAL

FEDERAL TRADE COMMISSION,
Washington, May 16, 1924.

The PRESIDENT OF THE SENATE.

SIR: There is submitted herewith a report on the wheat flour milling industry. This report, made in response to a Senate resolution, deals primarily with the costs and profits of commercial flour milling concerns, and shows a marked decline in flour costs, resulting from the unprecedented decline in wheat prices since 1920.

From January, 1919, to September, 1922, the monthly average quoted prices of flour declined 33 per cent in the northwestern (Minneapolis) district and 43 per cent in the southwestern (Kansas City) district; wheat prices declined 50 per cent in Minneapolis and 55 per cent in Kansas City, while bread prices declined about 2 per cent in Minneapolis, about 15 per cent in Kansas City, due to a price war, 6.6 per cent in Boston, and 2 per cent in New York City.

The above comparison shows that the decline in wheat prices, so disastrous to the farmer, has benefited the purchaser of bread very little.

ATTEMPT TO HAMPER THE INQUIRY

Soon after the commission sent out its cost and profits report form to flour milling companies an effort was made to hamper the inquiry by the publication of an opinion of the attorneys for the Millers' National Federation, the leading trade association of the flour industry, advising that "any miller has a right to refuse to answer the questionnaire, or any part, and to afford no information unless he chooses, but if he desires to accord some information he can give it, when, how, and as he pleases, but we would advise that under no circumstances the emissaries or representatives of the Federal Trade Commission, or any outsider, be given access to millers' books, papers, or documents, or be permitted to take any information or copies."

ATTITUDE OF FLOUR MILLERS

Although this advice was given wide publicity, practically every company requested, including the members of the federation, disregarded it and cooperated heartily in sending in the data requested, or in granting access to their books and in assisting the commission's accountants in the preparation of the reports.

When the commission's cost and profit report form was sent to the wheat-flour milling industry, certain flour trade journals and some millers complained of the expense and time which would be required to compile the data requested. A number of companies having good accounting records returned the schedule completely filled out

within a few days, the time required for their preparation being reported as from 20 to 48 hours for one man. This corresponded with the experience of the commission's accountants in preparing reports for some of the larger flour-milling concerns.

CONCENTRATION IN THE INDUSTRY

The number of merchant wheat-flour mills decreased from 6,900 in 1914 to 4,800 mills in 1921 (the latest census enumeration), a decline of 30 per cent, while the average production per mill increased from about 16,900 barrels to 23,000 barrels per annum, or 36 per cent.

Although there were about 4,800 merchant wheat-flour mills in the United States in 1921, a few companies produced a large proportion of the total output. In that year five large flour-milling companies, operating 49 mills, and each producing in excess of 2,000,000 barrels, had an aggregate production of over 25,000,000 barrels, or nearly 23 per cent of the country's total; and eight companies with 87 mills, each producing in excess of 1,000,000 barrels, had a total production of almost 30,000,000 barrels, or 27 per cent of that total. This concentration was largely the result of the expansion of business on the part of some of the largest flour-milling concerns, although it was partly the result of the merging of different interests.

The bulk of the wheat flour produced in the United States is manufactured in a few States. In 1921 flour mills located in Minnesota alone produced one-fifth of the total output of the entire country, those of Minnesota and Kansas combined three-eighths, and those in Minnesota, Kansas, New York, and Missouri one-half of the total. The three principal wheat-flour milling centers in the order of their importance are Minneapolis, Buffalo, and Kansas City.

About 99 per cent of the total wheat-flour output of the country is produced by so-called merchant mills, which purchase grain and sell the mill products, as contrasted with the custom mills, which grind the grain for a fixed charge.

FLOUR-MILLING PROFITS 1919–1922

Extensive data on flour-milling investment and income for the four-year period 1919–1922, were secured from 108 companies, which produced over 40 per cent of the total wheat-flour output of the country. The investment and rate of return thereon are shown on two different bases, (1) milling investment, and (2) company investment. The milling investment includes the funds actually used in the milling business, while the company investment is that which the stockholders collectively, as a company, have in the business. The milling investment includes borrowed funds but excludes outside investments, while the company investment includes outside investments but excludes borrowed funds.

The average rate of net profit on the milling investment for all companies combined for the four-year period 1919–1922 was 10.6 per cent, the annual average rates being as follows: 1919, 13.9 per cent; 1920, 14.9 per cent; 1921, 1.6 per cent; and 1922, 10.9 per cent. The average rate of profit of these companies varied considerably according to the sections of the country in which they were located.

By districts, the four-year average rates of profit of the companies reporting were as follows: Northwestern district, including Minnesota and neighboring States, 11.7 per cent; southwestern, including Kansas and neighboring States, 11 per cent; mountain and coast, including the north Rocky Mountain and Pacific Coast States, 9.3 per cent; southeastern, including States east of the Mississippi and south of the Ohio Rivers, 7.8 per cent; and central and eastern, including States east of Wisconsin and Iowa, 7.6 per cent.

The average rate of milling profit for individual companies showed a wide range in each year of the period. Thus in 1920 when the average for all companies was 14.9 per cent, the rate for individual companies ranged from a loss of 51.4 per cent to a profit of 49.2 per cent. On the other hand, in 1921, when the average rate of profit for all companies was only 1.6 per cent, the range was from a loss of 72.6 per cent to a profit of 44.1 per cent. Taking the average rate of profit for the four-year period 1919–1922 for each individual company, the range was from a loss of 10.6 per cent to a profit of 40 per cent.

On the company investment, which excludes borrowed funds employed in the business, the average rate of return for the four-year period for these 108 companies was 12.7 per cent, the rates for the several years being as follows: 1919, 18.3 per cent; 1920, 20.9 per cent; 1921, a loss of one-tenth of 1 per cent; and 1922 a profit of 12.5 per cent.

PROFITS PER BARREL

The milling profit per barrel showed a wide range for different years and for different milling districts. The average profit per barrel for all companies was as follows: 47 cents in 1919, 58 cents in 1920, 6 cents in 1921, and 32 cents in 1922, with an average for the four-year period of 36 cents per barrel.

There was, of course, a wide range for different sections of the country. For example, the four-year average profit per barrel for different districts was as follows: Mountain and coast, 54 cents; central and eastern, 40 cents; southwestern, 39 cents; northwestern, 32 cents; and southeastern, 31 cents. The extreme range in annual averages by districts was from a profit of $1.06 per barrel in 1920 in the mountain and coast district to a loss of 31 cents per barrel for the same district in the following year.

PROFITS FOR THE PERIOD 1913–1922

The profits for 28 identical companies, producing about 29 per cent of the total wheat flour production for the entire country, which were secured for the 10-year period, 1913–1922, averaged 18.5 per cent on the milling investment for the entire period. For the four-year period, 1919–1922, the average rate of profits of these 28 companies was 13.9 per cent, as compared with 10.6 per cent for the 108 companies. The range in annual average rate of profit for the 10-year period for the 28 companies was from 2.6 per cent in 1921 to 36.5 per cent in 1917. On the company investment the rate of profit for these 28 companies for the 10-year period, 1913–1922, averaged 19.9 per cent. These 28 companies included most of the very large wheat flour milling concerns.

COST OF PRODUCTION

Costs of wheat-flour production for 108 different companies, producing over 40 per cent of the output for the entire country, are presented for the four-year period 1919–1922, and for 28 identical companies, producing 29 per cent of the output for the 10-year period 1913–1922.

The four-year average cost of the 108 companies was $8.85 per barrel, the annual average cost ranging from $10.98 per barrel in 1920 to $5.97 per barrel in 1922. For the 10-year period the annual average cost of producing a barrel of wheat flour increased rapidly from 1913 to 1920, after which there was a sharp decline. The annual average cost for the 28 companies increased from $3.84 per barrel in 1913 to $11.09 per barrel in 1920, and then decreased to $6.03 per barrel in 1922.

COST OF WHEAT IN FLOUR

During the four-year period, 1919–1922, the average cost of the wheat constituted almost 90 per cent of the cost of flour and its by-products, cost of packages nearly 4 per cent of this total cost, labor about 2.5 per cent, and general expenses and depreciation about 2.5 per cent. The average quantity of wheat used per barrel of flour was 4.56 bushels, ranging from 4.47 bushels in 1919 to 4.63 bushels in 1920.

The average cost of wheat ranged from $11.57 per barrel of flour in 1920 to $5.84 per barrel in 1922. In 1922, by districts, the average cost of wheat per barrel of flour was as follows: Mountain and Coast, $5.07; Northwestern, $6.18; Southwestern, $5.27; Southeastern and Central and Eastern, each $6.19 per barrel.

This marked decline in the cost of wheat per barrel of flour does not fully reflect, of course, the disastrous decline in the prices of wheat from 1920 to 1922. The purchase prices of wheat at the mills, for these 108 companies, averaged $2.28 per bushel in 1919; $2.50 in 1920; $1.82 in 1921; and $1.28 in 1922. The decrease in this average delivered price of wheat from 1920 to 1922 was almost 50 per cent. If the prices of wheat were reckoned at the farm the percentage of decline would be, of course, still greater.

FLOUR AND FEED PACKAGES

The cost of packages was the second largest item in the mill cost of flour and averaged 40 cents per barrel for the four-year period 1919–1922.

The absence of Federal laws regulating the sizes of flour and feed packages and the widely varying State laws and customs have resulted in an unnecessary diversity and multiplicity of packages, thus increasing cost of production and distribution. The need of standardizing the sizes of packages has long been recognized. The laws of various States requiring that the weight contents shall be marked on each package do not satisfy this need. Forty-one States have such laws for flour packages, and 46 States for commercial feeding stuffs. Weight marking laws afford no relief from the waste involved in a multiplicity of packages, nor do they give full protection against deception of the consumer.

Not less than 34 different sizes of flour packages are now in use in the domestic trade. Reports from 80 representative milling companies show that more than 97 per cent of their combined sales in 1922 were in 12 different sizes of packages, which in fact really represented only 6 different sizes of packages, namely, the barrel, half barrel, quarter barrel, eighth barrel, and sixteenth barrel, and the special 140-pound export sack. The close resemblance between 48 and 49 pound sacks, 24 and 24½ pound sacks, and 12 and 12¼ pound sacks, respectively, affords an easy opportunity for deceiving the uninformed or unobservant purchaser.

Aside from the 140-pound sack, which is the customary size for bulk sales and export business, the entire list of flour packages might well be limited to a few standard sizes each one of which would be so distinctly different in weight as to leave no room for mistake by the purchaser. The proposed "decimal weight law" would accomplish this purpose. It aims at simplicity and economy, and its adoption would remove the unsatisfactory conditions arising from the present multiplicity of packages. This proposed law appears to have practically the unanimous and unqualified approval of all the factors engaged in the different branches of business which have to do with the production and distribution of flour and feed.

WHEAT, FLOUR, AND BREAD PRICES

Monthly average quoted prices for hard spring wheat flour in the northwestern district, (first family patent) based upon millers' quotations, f. o. b. mill, increased from $10.31 per barrel in January, 1919, to $15.66 per barrel in May, 1920, an increase of 52 per cent, and then declined to $6.88 per barrel in September, 1922, or 33 per cent below the January, 1919, average price. The monthly average quotation for the same grade of hard winter wheat flour in the southwestern district increased from $10.08 per barrel in January, 1919, to $13.32 per barrel in May, 1920, an increase of 32 per cent, and then declined to $5.79 per barrel in September, 1922, or 43 per cent below the January, 1919, average price.

The monthly average price of No. 1 northern hard spring wheat at Minneapolis increased from $2.21 per bushel in January, 1919, to $3.09 per bushel in May, 1920, an increase of 40 per cent, and then fell to $1.10 per bushel in September, 1922, or 50 per cent below the average price in January, 1919. In Kansas City the monthly average price of No. 2 hard winter wheat increased from $2.31 per bushel in January, 1919, to $2.93 per bushel in May, 1920, an increase of 27 per cent, and then declined to $1.04 in September, 1922, or 55 per cent below the average price in January, 1919.

Data collected and published by the United States Bureau of Labor Statistics show that bread prices have not decreased in like degree with the prices of wheat and flour. For example, in Minneapolis, the retail price of a 1-pound loaf of bread was 9.2 cents in January, 1919, and 9 cents in September, 1922; in Kansas City it was 9.3 cents in January, 1919, and 7.9 cents in September, 1922; in Boston 9.1 cents in January, 1919, and 8.5 cents in September, 1922; and in New York City 10 cents in January, 1919, and 9.8 cents in September, 1922.

By the commission:

HUSTON THOMPSON, *Chairman.*

WHEAT FLOUR MILLING INDUSTRY

SUMMARY

ORIGIN AND SCOPE

This report on the wheat-flour milling industry is made in compliance with Senate Resolution 212, Sixty-seventh Congress, second session, adopted January 18, 1922, which directed the commission "to extend its investigation of commercial wheat-flour milling from the date of the conclusion of its investigation of said industry included in its report to Congress on September 15, 1920, up to the close of the fiscal year ending June 30, 1921."

In harmony with the wording of this resolution the commission limited the intensive work of the present inquiry to the phases of the wheat flour milling industry covered by its previous report. In order to furnish Congress with more recent information the period covered on flour milling costs and profits was extended to include the business year ending in 1922.

ATTEMPT TO HAMPER THE INQUIRY

Soon after the commission sent out its cost and profit report form to flour milling companies an effort was made to hamper the inquiry by the publication of an opinion of the attorneys for the Millers' National Federation, the leading trade association of the flour industry, advising that "any miller has a right to refuse to answer the questionnaire, or any part, and to afford no information unless he chooses, but if he desires to accord some information he can give it when, how, and as he pleases, but we would advise that under no circumstances the emissaries or representatives of the Federal Trade Commission, or any outsider, be given access to millers' books, papers, or documents or be permitted to take any information or copies."

ATTITUDE OF FLOUR MILLERS

Although the above advice was given wide publicity, practically every company requested, including the members of the federation, disregarded it and cooperated heartily in sending in the data requested or in granting access to their books and in assisting the commission's accountants in the preparation of the reports.

When the commission's cost and profit report form was sent to the wheat flour milling industry certain flour trade journals and some millers complained of the expense and time which would be required to compile the data requested. A number of companies having good accounting records returned the schedules completely filled out within a few days, the time required for their preparation being reported as from 20 to 48 hours for one man. This corresponded with the experience of the commission's accountants in preparing reports for some of the larger flour milling concerns.

GROWTH AND CONCENTRATION IN THE INDUSTRY

Wheat flour is produced by two classes of mills, namely, (1) merchant flour mills, which purchase grain and sell the mill products after grinding, (2) custom or neighborhood mills which grind their customers' grain for a fixed charge or toll, which may be taken in cash or in kind. Although the number of custom mills was about double the number of merchant mills in 1921, the latter produced over 99 per cent of the country's total wheat flour output.

Since 1914 the annual total quantity of wheat flour produced by merchant mills in census years has fluctuated from about 110,000,000 to 132,500,000 barrels. The change from year to year is largely due to fluctuations in inventories and in the quantity exported. For the fiscal years ending June 30, 1914, to 1923, the quantity exported has ranged from 11,820,000 barrels to 24,180,000 barrels.

During the period 1914 to 1921 (the latest census enumeration) the number of merchant flour mills decreased from 6,876 to 4,809, which represents a decline of 30 per cent, while the average production per mill increased from 16,929 barrels in 1914, to 23,049 barrels in 1921, or an increase of 36 per cent. The decrease in the number of mills was due to the gradual elimination of the smaller ones.

Although there were about 4,800 merchant wheat flour mills in the United States in 1921, a few companies produced a large proportion of the total output. In that year five large flour milling companies, operating 49 mills and each producing in excess of 2,000,000 barrels, had an aggregate production of over 25,000,000 barrels or nearly 23 per cent of the country's total; and eight companies with 87 mills, each producing in excess of 1,000,000 barrels, had a total production of almost 30,000,000 barrels, or 27 per cent of that total. This concentration was largely the result of the expansion of business on the part of some of the largest flour milling concerns, although it was partly the result of the merging of different interests.

The bulk of the wheat flour produced in the United States is manufactured in a few States. Minnesota is by far the largest wheat flour producing State, Kansas ranks second, New York third, Missouri fourth, and Illinois fifth. In 1921 Minnesota alone produced 21.4 per cent of the country's total, Kansas 15.7 per cent, New York 7.6 per cent, Missouri 5.7 per cent, and Illinois 4.7 per cent. These five States had about 55 per cent of the 1921 total.

The three principal wheat-flour milling centers in the order of their importance are Minneapolis, Buffalo, and Kansas City. These three centers have in their immediate vicinity a milling capacity sufficient to produce approximately 37 per cent of the country's total wheat-flour production.

METHODS OF DETERMINING PROFITS

The investment and rate of return thereon is presented on two different bases, (1) milling investment and (2) company investment.

The milling investment, as the term implies, includes the actual capital used in the milling business. It was computed as the sum of the capital stock, bonds, other borrowed money, surplus, and special reserves, less any appreciation, good will, or outside investments as determined from an analysis of the assets.

The company investment is the investment which the stockholders collectively, as a company, have in the business. It was obtained by deducting bonds and other borrowed money from the milling investment, but adding thereto the outside investments.

Two kinds of profit, corresponding to the two kinds of investment, are presented, namely, (1) milling net income, which is the net profit received from all sources excepting that from outside investments; (2) company net income, which is the net profit that accrues to the stockholders collectively, as a company, before the payment of income or excess-profits taxes.

PROFITS ON THE MILLING INVESTMENT

Net profits are presented covering companies producing from 40 to 50 per cent of the total output of wheat flour for the period 1919–1922, and for 28 identical companies which produced about 29 per cent of the total output for the period 1913–1922.

The average rate of return on the milling investment for all companies ranged from a maximum of 14.9 per cent in 1920 to a minimum of 1.6 per cent in 1921. For the four-year period 1919–1922 the true or weighted average rate of return (obtained by dividing the sum of the earnings for all companies covered by their aggregate investment) was 10.6 per cent, while the simple average (obtained by dividing the sum of the rate of return for each company by the number of companies covered) was 8.5 per cent. The average rate of return varied considerably for different sections of the country. For example, for the four-year period the companies covered for the northwestern district, operating mills in Montana, the Dakotas, Minnesota, Wisconsin, northern Nebraska, and northern Iowa, had an average net profit of 11.7 per cent; the southwestern district, embracing mills operated in the States of Texas, Oklahoma, Kansas, southern Nebraska, Missouri, and Arkansas, had an average of 11 per cent; the mountain and coast district, covering mills in Colorado, Idaho, Utah, Oregon, Washington, and California, had an average of 9.3 per cent; the southeastern district, which covers companies with mills in the southeastern section of the United States east of the Mississippi and south of the Ohio Rivers, averaged 7.8 per cent; and the companies with mills in the eastern and central district, embracing the Central and Eastern States, had an average of only 7.6 per cent.

SIZE OF INVESTMENT AND RATE OF PROFIT

Dividing the companies into five groups according to size of investment, the companies with the largest investments, taken as a group, had a much higher average rate of milling profit for the four-year period than companies with the smallest investments, but there was very little difference in the average rate for the medium group and either of the two larger groups; their average rates of return on milling investment for the four-year period was 10.5 per cent, 10 per cent, and 11 per cent, respectively. If a simple average were taken instead of a true average, the group of com-

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panies with investments of medium size would still show the second highest rate of return.

During the four-year period, 1919–1922, the smaller companies had also a greater fluctuation in the rate of return from year to year than the large companies, or those of intermediate size. The four-year average rate of return on the milling investment for companies having an average investment under $250,000 was 6.1 per cent and the rate during the period ranged from an average loss of 5.4 per cent in 1921 to an average net profit of 18.6 per cent in 1919; companies having an average investment ranging from $250,000 to $500,000 had a four-year average return on investment of 8.4 per cent, with a range in average annual net profit from only one-tenth of 1 per cent in 1921 to 14.8 per cent in 1919; companies with an investment ranging from $500,000 to $1,000,000 earned 10.5 per cent for the four years, the average annual profit ranging from a loss of 2.6 per cent in 1921 to a net profit of 18 per cent in 1919; companies with investments of from $1,000,000 to $2,000,000 earned 10 per cent for the period and had average annual returns ranging from a loss of four-tenths of 1 per cent in 1921 to a net profit of 15.5 per cent in 1919; and the largest flour-milling concerns with an investment of $2,000,000 and over had an average rate of return for the four-year period of 11 per cent, ranging from an average of 2.8 per cent in 1921 to 15.5 per cent in 1920.

MILLING PROFITS OF INDIVIDUAL COMPANIES

There was a wide range in the profits of individual companies. The annual average rate of return on the milling investment for 108 individual companies for the period 1919–1922, ranged from a loss of 10.6 per cent to a net profit of 40 per cent. Fourteen companies showed an average loss for the four-year period, the losses ranging from 1.2 per cent to 10.6 per cent.

As already stated, the smaller companies generally had a lower average rate of profit on their milling investment than the large companies or those of intermediate size. For the four-year period, 1919–1922, the 14 companies showing a loss constituted 13 per cent of the total number, but they had only 2.5 per cent of the total investment and 2.5 per cent of the production of the 108 companies. Twenty-one other companies, or 19.4 per cent of the total number of companies, earned less than 5 per cent (not including those showing a loss) and only had 9.8 per cent of the investment and 7.7 per cent of the production. Twenty-three companies, constituting 21.3 per cent of the total number of companies and earning from 5 to 10 per cent, had 31.7 per cent of the investment and 29.8 per cent of the production. Twenty-nine companies, constituting 26.9 per cent of the total number of companies and earning from 10 to 15 per cent had 41.6 per cent of the investment and produced 42.1 per cent of the combined production. Thirteen companies, constituting 12 per cent of the total number of companies, and earning from 15 to 20 per cent, had 12.9 of the investment and 15.6 per cent of the production, while eight companies, constituting 7.4 per cent of the total number of companies, and earning from 20 to 40 per cent during the period, had only 1.5 per cent of the investment and 2.3 per cent of the production. Thus, although as a group the larger companies had the

highest average rates of profit, the companies with the highest rates of return were much below the average. On the other hand, some of the smaller companies showed the largest losses for the four-year period. Those having a loss had a much smaller production per dollar invested than those earning 20 per cent and over.

Approximately 50 per cent of the investment and 44 per cent of the flour manufactured was produced by companies that individually earned on the average 11 per cent or less for the period 1919–1922; two-thirds of the investment was owned by concerns producing 58.5 per cent of the output covered, and they individually earned 13 per cent or less for the period; seven-eighths of the investment was owned by companies covering 83.6 per cent of the production which earned individually less than 15.5 per cent for the four years; while one-eighth of the investment was owned by companies with about one-sixth of the production, which earned from about 16 to 40 per cent for the period.

There was an even wider range in the profits and losses for individual years. In 1919 only two companies showed a loss, and the return on investment ranged from a loss of 11.1 per cent to a profit of 50.5 per cent, with an average of 13.9 per cent. In 1920, due to the sudden decline in wheat and flour prices during the last half of the year, 20 companies showed losses ranging from 1.2 per cent to 51.4 per cent, while profits ranged as high as 49.2 per cent, with an average of 14.9 per cent. In 1921, 57 companies had losses running as high as 72.6 per cent, while the remaining 50 companies had earnings ranging from less than one-tenth of 1 per cent to 44.1 per cent, with an average of only 1.6 per cent. In 1922, 17 companies showed a loss and 84 companies had a profit, the range being from a loss of 32.4 per cent to a profit of 47.3 per cent, with an average of 10.9 per cent.

PROFIT ON COMPANY INVESTMENT

As already stated, the company investment includes all of the money put into the business by the stockholders collectively as a company, or earnings accruing to them and left in the business. The return upon the company investment was higher than upon the milling investment for each year excepting 1921. This was partly due to the difference in the amounts of the two investments and partly because interest paid is not deducted from income in the case of earnings on the milling investment, whereas it is a deduction from the company income.

The average annual rate of return on the company investment for the 108 companies was 18.3 per cent in 1919, 20.9 per cent in 1920, a loss of one-tenth of 1 per cent in 1921, and a profit of 12.5 per cent in 1922, with an average of 12.7 per cent for the four-year period.

The annual average rate of return on the company investment for the northwestern district ranged from 4.7 per cent in 1921 to 21.5 per cent in 1920 with an average of 15.4 per cent for the period and for the other districts the results were as follows: Southwestern district, a loss of 2.9 per cent in 1921 and a maximum profit of 24.4 per cent in 1920, with a four-year average of 12.6 per cent; the mountain and coast district ranked third in profitableness, with a four-year average rate of profit of 9.8 per cent, and an annual range from a loss of 6.6 per cent in 1921 to a profit of 25.4 per cent in 1920; the central and eastern

district had a four-year average of 8.2 per cent, ranging from 1.1 per cent in 1921 to 16.1 per cent in 1919; the southeastern district had the lowest average profit for the four-year period, 8 per cent, and a range from an average loss of 4.2 per cent in 1921, to an average profit of 18.5 per cent in 1922.

PROFITS PER BARREL

The milling profit per barrel showed a wide range for different years and for different milling districts. The average annual milling profit per barrel on all flour sold for all companies covered ranged from 6 cents in 1921 to 58 cents in 1920, with an average for the period 1919–1922 of 36 cents per barrel. The average milling profit per barrel for all companies for different years was as follows: 47 cents in 1919, 58 cents in 1920, only 6 cents in 1921, and 32 cents in 1922.

There was, of course, a wide range for different sections of the country. For example, the four-year average for different districts was as follows: Mountain and coast, 54 cents per barrel; central and eastern, 40 cents; southwestern, 39 cents; northwestern, 32 cents; and the southeastern, 31 cents per barrel. The extreme range in annual averages, by districts, was from a profit of $1.06 per barrel in 1920 in the mountain and coast district to a loss of 31 cents per barrel for the same district in the following year.

The company profit per barrel was somewhat lower than the milling profit in each year due to interest paid for borrowed funds.

PROFITS FOR THE 10-YEAR PERIOD 1913–1922

The profits for 28 identical companies, producing about 29 per cent of the total wheat-flour production for the entire country, which were also secured for the 10-year period 1913–1922, averaged 18.5 per cent on the milling investment for the entire period. For the four-year period 1919–1922, the average rate of profits of these 28 companies was 13.9 per cent, as compared with 10.6 per cent for the 108 companies. The range in annual average rate of profit for the 10 years was from 2.6 per cent in 1921 to 36.5 per cent in 1917.

There was a wide range for individual companies. The combined 10-year average rate of milling profits for the 28 individual companies ranged from 4.9 per cent to 30.9 per cent. The individual company range for the single year 1921, the least profitable year, was even greater, namely, from a loss of 62.4 per cent to a profit of 24.3 per cent, while in 1917, which was the most profitable year, the lowest individual company profit was 8.3 per cent and the highest 94.3 per cent.

On the company investment the average rate of profit for the 10-year period 1913–1922 was 19.9 per cent. These 28 companies included most of the very large flour milling concerns.

PROFIT PER BARREL 1913–1922

The average milling profit per barrel for the 28 companies in 1922 was exactly double that for 1913, being 14 cents in 1913 and 28 cents per barrel in 1922. The average for the 10-year period was 30 cents per barrel, ranging from 6 cents in 1921 to 58 cents per barrel in 1917.

COST OF WHEAT-FLOUR PRODUCTION

Costs of wheat-flour production are presented for 108 different flour milling companies producing over 40 per cent of the total flour output for the four-year period 1919–1922, and for 28 identical companies producing about 29 per cent of the total for the 10-year period 1913–1922. These 108 companies ground 900,400,000 bushels of wheat and produced 197,530,000 barrels of flour during the four-year period 1919–1922. The four-year average cost of production was $8.85 per barrel, and the average annual cost ranged from $10.98 per barrel in 1920 to $5.97 per barrel in 1922.

There were considerable differences in the average costs for different sections of the country. In the northwestern district, which produces largely hard spring wheat flour, the cost averaged $9.10 per barrel for the period 1919–1922, with a maximum of $11.38 per barrel in 1920 and a minimum of $6.26 per barrel in 1922. The average cost for the southwestern district, which makes chiefly hard winter wheat flour, was $8.41 per barrel, with a cost of $10.54 per barrel in 1920 at the peak and $5.44 per barrel in 1922, which was the lowest point. The southeastern district, which produces soft winter wheat flour, had a four-year average cost of $9.02 per barrel, with a maximum of $11.28 per barrel in 1920 and a minimum of $6.20 per barrel in 1922. The central and eastern districts, which grind mainly soft winter wheat, produced locally, and hard spring wheat from Canada, Minnesota, and the Dakotas, had a four-year average cost of $8.99 per barrel, with annual costs ranging from $11.08 in 1920 to $6.21 per barrel in 1922. The four-year average for the mountain and coast district, which grinds hard spring wheat produced in the Mountain States, and the soft wheats grown in the Pacific Coast States, was $8.43 per barrel, while the yearly range was from $9.89 per barrel in 1920 to only $5.58 per barrel in 1922.

For the 10-year period the annual average cost of producing a barrel of wheat flour increased rapidly from 1913 to 1920, after which there was a sharp decline. The annual average cost for the 28 companies increased from $3.84 per barrel in 1913 to $11.09 per barrel in 1920, and then decreased to $6.03 per barrel in 1922. The lowest annual average cost for an individual company during the 10-year period was $3.46 per barrel in 1913, and the highest was $12.27 in 1920. The lowest post-war cost for a single company was $4.94 per barrel in 1922.

COST OF WHEAT IN FLOUR

During the four-year period 1919–1922 the average cost of the wheat constituted almost 90 per cent of the cost of flour and its by-products; the cost of packages nearly 4 per cent of this total cost, labor about 2.5 per cent, and general expenses and depreciation about 2.5 per cent. The average quantity of wheat used per barrel of flour was 4.56 bushels, ranging from 4.47 bushels in 1919 to 4.63 bushels in 1920. There was a considerable range in the quantity of wheat required to produce a barrel of flour for different sections of the country. The northwestern district used the greatest quantity of wheat per barrel of flour for each year of the period 1919–1922, the range being from 4.5 bushels in 1919 to 4.74 bushels in 1920, with an average of 4.63 bushels for the four years. The mountain

and coast district used the smallest quantity, its average for the four years being 4.42 bushels, ranging from 4.43 bushels in 1920 to 4.41 bushels in 1922.

The average cost of wheat ranged from $11.57 per barrel of flour in 1920 to $5.84 per barrel in 1922. In 1922, by districts, the average cost of wheat per barrel of flour was as follows: Mountain and coast, $5.07; northwestern, $6.18; southwestern, $5.27; southeastern and central and eastern, each $6.19 per barrel.

This sharp decline in the cost of wheat per barrel of flour does not fully reflect the disastrous decline in the prices of wheat from 1920 to 1922. The purchase prices of wheat at the mills for these 108 companies averaged $2.28 per bushel in 1919, $2.50 in 1920, $1.82 in 1921, and $1.28 in 1922. The decrease in this average delivered price of wheat from 1920 to 1922 was almost 50 per cent. If the prices of wheat were reckoned at the farm the percentage of decline would be, of course, still greater.

COMPARISON OF COSTS BY COMPANIES

There was a wide range in the cost per barrel of producing wheat flour for individual companies. This wide range was largely due to differences in the cost of the wheat ground. Wheat prices vary widely in different sections of the country, depending upon the kind and quality of wheat and upon its proximity to market. For example, in 1920, the year of highest costs for the four-year period, the cost of flour for individual companies ranged from $8.61 to $13.99 per barrel; in 1922, the low cost year, the range was from $4.87 to $8.12 per barrel. While there was a very wide range in individual costs for different years, most of the companies, and the bulk of the production for each year, fell within a fairly narrow range. In 1922, for example, companies producing over 53 per cent of the output covered had production costs ranging from $5 to $6 per barrel and 95 per cent of the output covered was produced at less than $7 per barrel, while the extreme range, as just stated, was from $4.87 to $8.12 per barrel.

FLOUR AND FEED PACKAGES

As already stated, the cost of packages was the second largest item in the mill cost of flour; it averaged 40 cents per barrel for the four-year period 1919–1922.

The absence of Federal laws regulating the sizes of flour and feed packages and the widely varying State laws and customs have resulted in an unnecessary diversity and multiplicity of packages, thus increasing the cost of production and distribution. The need of standardizing the sizes of packages has been recognized. The laws of various States requiring that the weight contents shall be marked on each package do not satisfy this need. Forty-one States have such laws for flour packages and 46 States for commercial feeding stuffs. Weight marking laws afford no relief from the waste involved in a multiplicity, nor do they give full protection against deception of the consumer.

Not less than 34 different sizes of flour packages are now in use in the domestic trade. Reports from 80 representative milling companies show that more than 97 per cent of their combined sales in 1922 were in 12 different sizes of packages, which in fact really represented only 6 practically different sizes of packages, namely, the barrel, half barrel, quarter barrel, eighth barrel, sixteenth barrel, and the special 140-pound export sack. The close resemblance between the 48 and 49 pound sacks, the 24 and 24½ pound sacks, and the 12 and 12¼ pound sacks, respectively, affords an easy opportunity for deceiving the uninformed and unobservant purchaser.

MULTIPLICITY OF FLOUR PACKAGES

As a result of special inquiries addressed to various State and local officials and flour milling companies, extensive information was obtained regarding the weights of the different sizes of flour packages prescribed either by law or by regulation or in use by virtue of trade custom. It appears that not less than 34 different sizes of packages are in use in the domestic trade in the various States. A study of the data shows that 12 States and the District of Columbia have no laws or regulations fixing the size of flour packages or containers. These States are Arizona, Colorado, Florida, Montana, New Hampshire, New Jersey, New Mexico, New York, Utah, Vermont, Washington, and Wyoming. On the other hand, there are 33 States in which the law prescribes the standard weight of a barrel of flour and 2 in which it is fixed by regulation at 196 pounds, while in Texas the law provides for a 200-pound barrel, though the 196-pound barrel is in use by custom. In 13 States only the standard barrel is prescribed by law, all other packages being in use by custom. In addition to the standard barrel and half barrel, 19 States have provided by law or regulation for from two to four other packages, most of which are irregular sizes or not even fractional parts of the standard barrel. These States are California, Idaho, Illinois, Kansas, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Virginia, and West Virginia. Fourteen of these States have from one to seven such packages by custom. It may be noted also that Michigan is the only State that has provided by law for a complete list of packages down to the 6¼-pound sack that are even fractions of the standard 196-pound barrel. In a number of States many sizes of packages are in use by custom. Alabama, by administrative regulation, and Georgia, by statute, have the standard 196-pound barrel, while the half barrel and all smaller packages are even fractions of a 192-pound barrel. Texas is the only State in which the so-called decimal weight basis, i. e., 200-pound barrel, has been adopted, but, by a decision of the attorney general of the State, flour may be offered for sale in any size package when properly marked showing the net weight contents.

Nineteen States have from one to four flour packages in use at the present time which deviate from the standard barrel or even fraction of a barrel. Under the proposed so-called decimal weight system the illogical and uneconomical complexity in the sizes of flour packages would be avoided and the opportunity for deception would be greatly reduced.

PACKAGE WEIGHT MARKING LAWS

The misbranding section in the Federal food and drugs act requires that all articles of food in package form entering into interstate commerce must have the quantity of the contents plainly and conspicuously marked on the outside of each package in terms of weight, measure, or numerical count. The main purpose of the Federal package weight requirement is to safeguard the interests of the public in purchasing articles of food and prevent fraudulent dealing in short-weight packages of food shipped in interstate commerce. So far as reported to this commission, 41 States also require that the weight contents of flour packages must be marked thereon, while in 46 States there is a similar requirement for commercial feeding stuffs.

The abuses resulting from a multiplicity and diversity of packages are not removed by marking the weight on the package. On the contrary, the various marking requirements rather tend to promote the multiplicity of packages, which is one of the principal grievances of the millers. While there is no question but that these weight-marking provisions have been of benefit to the public in general, yet for certain classes of consumers the protection intended by the marking requirements has not been fully attained. The weight shown upon the package is a notice that it contains a certain quantity of flour, and with many purchasers this is all the protection necessary. Unfortunately all purchasers do not understand the significance of the weight figures on flour packages. The number of this class of purchasers is of course unknown, but considering merely the illiterate, according to the census of 1920 there were 72,000,000 persons 15 years of age and over in the United States, and of this number 4,686,000, or 6.5 per cent, were classed as illiterate. This part of the public is not adequately protected by the requirements that the weight of the contents be plainly marked upon the package. Throughout the hearings on the several bills that have been before Congress, also in communications to this commission, reference was made to the deception and fraud practiced by unscrupulous retail dealers in selling flour to unobservant purchasers.

INCONVENIENCE OF PRESENT DIVERSITY OF PACKAGES

While at least 34 different sizes of packages are either authorized by law or in use by custom, it does not necessarily follow that all of these packages are needed in actual trade. As shown by the official list of flour packages approved by the Millers' National Federation (see Appendix, p. 127) only 21 separate sizes in 4 different kinds of containers are provided for. Two are for the 196-pound and 98-pound standard barrel and half-barrel in wood, 2 in 140-pound and 98-pound jute sacks, 19 range from 2-pound to 98-pound cotton sacks, and 15 paper sacks which with four exceptions duplicate the sizes for the cotton sacks. So far as the demand for particular sizes of flour packages is concerned, reports from 80 representative milling companies show that in 1922 about 94 per cent of the sales by southeastern mills required only five different sizes of packages, while in other sections of the country from 92 to 97 per cent of the flour sales were in seven different sizes of containers.

Furthermore, while more than 97 per cent of the combined sales of all these companies were in 12 different sizes of packages, as a matter of fact, the 12 sizes represented only 5 regular package units and 1 special unit, the 140-pound sack. The difficulties and abuses which are complained of by the milling industry are largely ascribed to the present duplicate classification for the quarter-barrel, eighth-barrel, and sixteenth-barrel sizes.

Aside from the 140-pound sack, which is the customary size for bulk sales and export business, the entire list of flour packages might well be limited to a few standard sizes each one of which would be so distinctly different in weight as to leave no room for mistake by the purchaser. The elimination of the duplication of packages particularly for the quarter-barrel, eighth-barrel, and sixteenth-barrel sizes is important because it would remove the possibility of deceiving the uninformed and unobservant purchaser, and also because the consumer, as a consequence of the added expense of packing in so many different packages, must ultimately pay a higher price for flour. The proposed "decimal-weight law" would accomplish these purposes (see p. 99). It aims at simplicity and economy and its adoption would remove the unsatisfactory conditions arising from the present multiplicity of packages. This proposed law appears to have practically the unanimous and unqualified approval of all the factors engaged in the different branches of business which have to do with the production and distribution of flour and feed.

WHEAT, FLOUR, AND BREAD PRICES

Monthly average quoted prices for hard spring wheat flour in the northwestern district (first family patent) based upon millers' quotations f. o. b. mill, increased from $10.31 per barrel in January, 1919, to $15.66 per barrel in May, 1920, an increase of 52 per cent, and then declined to $6.88 per barrel in September, 1922, or 33 per cent below the January, 1919, average price. The monthly average quotation for the same grade of hard winter wheat flour in the southwestern district increased from $10.08 per barrel in January, 1919, to $13.32 per barrel in May, 1920, an increase of 32 per cent, and then declined to $5.79 per barrel in September, 1922, or 43 per cent below the January, 1919, average price.

The monthly average price of No. 1 northern hard spring wheat at Minneapolis increased from $2.21 per bushel in January, 1919, to $3.09 per bushel in May, 1920, an increase of 40 per cent, and then fell to $1.10 per bushel in September, 1922, or 50 per cent below the average price in January, 1919. In Kansas City the monthly average price of No. 2 hard winter wheat increased from $2.31 per bushel in January, 1919, to $2.93 per bushel in May, 1920, an increase of 27 per cent, and then declined to $1.04 in September, 1922, or 55 per cent below the average price in January, 1919.

Data collected and published by the United States Bureau of Labor Statistics show that bread prices have not decreased in like degree with the prices of wheat and flour. For example, in Minneapolis the retail price of a 1-pound loaf of bread was 9.2 cents in January, 1919, and 9 cents in September, 1922; in Kansas City it was 9.3 cents

in January, 1919, and 7.9 cents in September, 1922; in Boston 9.1 cents in January, 1919, and 8.5 cents in September, 1922; and in New York City 10 cents in January, 1919, and 9.8 cents in September, 1922. Bread prices in other cities show a similar situation.

From January, 1919, to September, 1922, as shown above, the monthly average quoted prices of flour declined 33 per cent in the northwestern district, and 43 per cent in the southwestern district; wheat prices declined 50 per cent in Minneapolis and 55 per cent in Kansas City; while bread prices declined about 2 per cent in Minneapolis, about 15 per cent in Kansas City due to a price war, 6.6 per cent in Boston, and 2 per cent in New York City. This comparison shows that the decline in wheat prices, so disastrous to the farmer, has benefited the purchaser of bread very little.

CHAPTER I

ORIGIN OF THE INQUIRY AND DEVELOPMENT OF THE INDUSTRY

Section 1. Resolution directing the inquiry.

On September 15, 1920, the Federal Trade Commission submitted a report to Congress on commercial wheat flour milling, and on January 18, 1922, the following resolution, introduced by Senator Norris, was adopted by the United States Senate:

Resolved, That the Federal Trade Commission be, and it is hereby, directed to extend its investigation of commercial wheat flour milling from the date of the conclusion of its investigation of said industry included in its report to Congress on September 15, 1920, up to the close of the fiscal year ending June 30, 1921.

In harmony with the wording of the above resolution, the commission limited the intensive work of this inquiry to the phases of the flour industry covered by its report on commercial wheat flour milling. As the entire force of the commission was engaged on pressing inquiries begun before the above resolution was passed, work on this report was not commenced until late in 1922. In order to furnish the Senate with recent information the period covered was extended so as to include the business year ending in 1922.

Section 2. Salient features of the 1920 report.

ORIGIN AND SCOPE.—The report of September 15, 1920, on commercial wheat flour milling, mentioned above, had its origin in connection with the general food investigation made by the commission during the World War and covered the five-year period ending in 1918. That report analyzed the operations of 37 important wheat flour milling concerns which ground somewhat more than 30 per cent of the total quantity of wheat flour produced by all flour mills in the United States for each year of the period covered.

LOCALIZATION OF COMMERCIAL MILLING.—In the general survey of the flour milling industry attention was called to the fact that the United States may be divided into definite areas according to wheat flour production and consumption. These areas were described as (1) "selling areas," in which there is normally a large surplus production of flour over the consumptive requirements of the population; (2) "buying areas," which include sections of the country in which the wheat flour production is not sufficient to meet the consumptive requirements of the population; (3) "neutral areas," in which the production and consumption are approximately equal; and (4) "small production areas," in which there was an entirely inadequate production of flour for the local population; of course these areas were also buying territories.

The selling areas include the Pacific Northwest, Montana, North Dakota, Minnesota, Nebraska, Kansas, Oklahoma, and Missouri. The "buying areas" (including "small production areas") embrace Nevada, Utah, Wyoming, Arizona, New Mexico, all the Southern States (except Tennessee), West Virginia, Pennsylvania, Delaware, New Jersey, New York, and the New England States. The "neutral areas," in which production and consumption nearly balance,

cover California, Colorado, South Dakota, Iowa, Wisconsin, Michigan, Illinois, Indiana, Ohio, Kentucky, Tennessee, Virginia, and Maryland.

Statistical data relative to the average annual production of wheat and wheat flour and the estimated population of these areas are presented for a period of years. As no material changes have taken place in this connection since the publication of the 1920 report, no extension of the data relating thereto is included in this report.

CONCENTRATION IN THE FLOUR-MILLING INDUSTRY.—The former report called attention to the fact that there was a concentration of wheat flour milling in a few favorably located cities, that 10 of the larger milling concerns probably had sufficient capacity to produce over half of the annual wheat-flour consumption in the United States, and that there had been an increase in the number of large flour mills. Minneapolis, Buffalo, and Kansas City, in the order named, were and are still the principal flour-milling centers. Statistics were presented which showed that the number of flour mills in the United States having an annual output in excess of 100,000 barrels was constantly increasing and that the number of mills with a smaller capacity was constantly decreasing. Although a large part of the annual production of flour was still produced by relatively small concerns, each operating a single plant, the report stated that "the tendency toward concentration in the wheat-flour industry is notable."

COSTS, PRICES, AND PROFITS.—The discussion of costs, prices, and profits was largely based upon data secured from 37 companies operating 86 mills, located in territory extending from New York City in the East to Billings, Mont., in the West; and from Duluth, Minn., in the North, to Nashville, Tenn., in the South.

These 86 mills were placed, according to geographical location, into three groups: The northwestern, 43 mills, mostly in Minnesota and North Dakota, grinding practically nothing but hard spring wheat; the southwestern, 24 mills, in the States of Kansas, Oklahoma, and Missouri, grinding probably from 80 to 90 per cent of hard winter wheat and from 10 to 20 per cent of soft winter wheat; and the eastern group, 19 mills, located roughly in a territory extending from New York to Chicago and from Grand Rapids, Mich., to Nashville, Tenn., grinding, as far as could be learned, both hard and soft winter wheat, according to occasion and location.

The salient features regarding the quantities of wheat ground, flour produced, and quantity and value of flour sales for these 37 companies as presented in the 1920 report are shown in the following table:

TABLE 1.—*Quantity of wheat consumed, flour produced and sold, and amount of flour sales, for 37 companies for their business years, 1914–1918*

Year	Wheat consumed	Flour		
		Produced	Sold	
	Bushels	*Barrels*	*Barrels*	*Dollars*
1914	168,062,000	37,985,000	38,450,000	159,656,875
1915	170,311,000	37,660,000	38,231,000	212,058,742
1916	198,892,000	43,761,000	43,430,000	227,969,626
1917	165,568,000	35,991,000	36,777,000	314,316,580
1918	150,464,000	33,901,000	34,659,000	354,192,287

The quantities of wheat ground by these 37 companies ranged from a minimum of about 150,000,000 bushels in 1918 to a maximum of nearly 200,000,000 bushels in 1916; the value of their sales increased from about $160,000,000 in 1914 to $354,000,000 in 1918.

The average receipts and profit per barrel and the rate of return on the investment for the 37 companies, as presented in the 1920 report, were as follows:

TABLE 2.—*Average receipts and profits per barrel of flour and rate of return on investment for 37 companies for their business years, 1914–1918*

Year	Receipts per barrel	Profit per barrel	Rate of return on investment
1914	$4.15	$0.14	12.6
1915	5.55	.21	17.2
1916	5.25	.14	13.1
1917	8.55	.55	38.4
1918	10.22	.65	34.1

The average receipts f. o. b. mill per barrel of wheat flour increased from $4.15 in 1914 to $10.22 in 1918; the profit per barrel increased from 14 to 65 cents, while the rate of return on investment ranged from a minimum of 12.6 to a maximum of 38.4 per cent.

Incomplete data gathered on the flour jobbing business showed a marked increase from 1914 to 1918 in the expense of handling flour. Car-lot jobbing expenses, for individual concerns, varied from about 5 to 16 cents per barrel in 1914 and from 6 to 19 cents per barrel in 1918; while the average expenses for less-than-car-lot business increased from 25 cents per barrel in 1914 to 39 cents per barrel in 1918. The per-barrel profit on car-lot business showed a wide range for individual companies and for different years; in 1918 the net profits on this business ranged from 12 to 31 cents per barrel. On the less-than-car-lot business the average per-barrel profit, including proprietors' salaries, increased from 16 cents per barrel in 1914 to 35 cents in 1917 and then declined to 16 cents per barrel in 1918. Owing to lack of funds to cover the expenses of the inquiry, the costs and profits of flour jobbers were not ascertained for the present report.

Section 3. Development of the flour milling industry.

Cereals have constituted an important part of the food of man from the earliest times. Among primitive peoples the tools for making flour were very crude and included a mortar, in which the grains of cereal were crushed by pounding with a mallet or pestle. This impact form of crushing the grain was followed by the use of the friction method, in which the wheat was ground between two stones known as the saddle-stone method. Later the simple mill, or quern, operated by two persons, introduced a revolving motion in the upper stone. The principle employed in this form of mill was followed for several thousand years during which the only important advancement made related to the motive power used and not to the method of grinding. The Greeks and Romans in-

creased the capacity of their flour mills by enlarging the stones and utilizing animals, wind, and water for motive power. This enlargement of the mill led to the establishing of a flour market.

In succeeding centuries, however, improved processes were adopted. The grain was elevated mechanically and was thus fed into the hopper regularly. Then improved means were devised for sifting the product. The flour still mixed with the bran and other feed by-products was again elevated and, descending through a series of sieves of various materials, was thus separated from the bran and the lower grades of meal. In the middle of the seventeenth century French engineers introduced a sifting bag, and in the eighteenth century a system of repeated milling was inaugurated, which is now the standard practice.

In the development of the milling industry in the United States many innovations were introduced. The old sifting process (bag sifter) was replaced by reel separators in which silk was finally used as the bolting cloth. Elevators, conveyors, and flour cooling systems were installed and the entire technique of the milling industry was changed by the development of the automatic mill. This was the era of the gristmill where wheat, grown in the neighborhood, was ground into flour and middlings, with bran as a residual product.

About 1820 several cities, such as Rochester, N. Y., St. Louis, Mo., and Richmond, Va., were important milling centers doing a considerable volume of business for domestic and foreign trade. Wheat flour during the greater part of the nineteenth century was made almost entirely from winter wheat, with local exceptions in various States where spring wheat only was available. The entire wheat crop in 1840, according to the census returns, was only 88,000,000 bushels, which was all grown east of the Mississippi River, but in 1866 it had increased to 152,000,000 bushels, and production continued to increase rapidly as settlers moved into the States west of the Mississippi River.

The States adjacent to the Canadian borders all raised spring wheat, which was not considered suitable for conversion into good flour because the product had a dark color. This was due to a defective milling process, wherein the dry outer skins of hard wheat were ground to a fine bran, which could not be eliminated, and thus injured the appearance and value of the flour.

A machine for purifying the meal was the result of various experiments during the first half of the nineteenth century. The process consisted in subjecting the mass of middlings to a current of air by which the lighter branny particles were blown away, while the heavier components remained. One of these machines was installed in a mill at Minneapolis in 1870 and immediately the flour made from the despised spring wheat advanced to a leading position among the various brands of flour sold in the American domestic and export trade, and Minneapolis became the chief wheat-flour milling center of the United States. The method of grinding grain by the use of rolls was first devised by a Swiss engineer about 1820. By 1880, or soon thereafter, all the large mills in America were converted to roller mills, and this method became the standard practice throughout the United States and Canada. Adoption of the purifier and the rolls revolutionized the milling industry in this country. Large commercial mills were erected at strategic points, while many local

mills declined to the position of grist mills, grinding for a toll. The merchant miller of to-day has a broad market and is often engaged in the export trade so that he may be vitally interested in the growth of wheat and the exports of flour from Canada, Argentina, Australia, India, and Egypt.

Section 4. Kinds of wheat and their flour products.

Wheat in the United States is classified according to season of planting as fall or winter and spring wheat, according to texture as soft and hard wheat, and as to color as dark, red, yellow, and white. Certain climates and soils favor the growth of one kind more than another, so that in certain sections a hard winter wheat flourishes while a soft variety will not, and vice versa. The Eastern, Southern and the Central States east of the Mississippi River, excepting Wisconsin, produce soft wheat chiefly; Minnesota, Wisconsin, Montana, the Dakotas, and northern Nebraska, hard spring wheat; Kansas, Oklahoma, and southern Nebraska, hard winter wheat; and the Pacific Coast States both soft spring and soft winter wheat. Durum, a very hard spring wheat, thrives in a broad stretch of country extending from Minnesota and the Dakotas to Texas.

According to prevailing milling methods there are certain differences between both the flour yield and the quality of flour made from the different wheats, which are of distinct commercial importance. From the heaviest soft wheat the yield of flour is generally about 80 per cent; from the heaviest hard wheats about 74 per cent; the lightest soft wheat yields about 65 per cent flour, and the lightest hard wheat about 67 per cent.

Soft-wheat flour has less gluten in it than hard-wheat flour, and is less nutritious and savory; but it has more starch and the loaf made from it is whiter and more attractive. It is, therefore, particularly suited for being made into crackers, the hot soda biscuit of the Southern States, pastry and cake.

Hard-wheat flour is rich in gluten, the part of the wheat which builds tissue. It readily absorbs water, and the gluten, swelling several times greater than its dry bulk, becomes elastic and tenacious. It is best suited for making the ordinary white loaf, or "light bread" or "baker's bread." The wheat from which such flour comes is typified in the Turkey red of Kansas and the hard spring wheat of the Red River region of North Dakota and Minnesota. Unlike soft-wheat flour, the hard-wheat product is not so well esteemed for making pastry and cake, as, on account of the tenacity of its gluten, it becomes tough when prepared for these purposes.

The flour made from durum wheat has a high gluten content, and in the United States it is used chiefly for making macaroni. In France and Russia, however, it is also made into bread, which, though dark in color, has a fine flavor. The dark color of the bread made from durum flour probably has much to do with the prejudice in this country against using it in bread making.

Section 5. Process of wheat flour manufacture.

Flour is made from the wheat berry by successive processes of grinding and sifting. Preliminary to these processes the wheat is cleaned, scoured, and conditioned.

The cleaning is done by passing the grain through two separators—the receiving and the milling—both supplied with sieves and air-

suction devices for removing foreign matter. In the receiving separator the weed seed, trash, straw, etc., are eliminated, and in the milling separator the grain is still more thoroughly cleaned. Other separators are provided for removing oats, mustard, garlic, etc., and metallic substances are taken out by a magnetic separator. The dirt and dust which remain on the wheat are then removed in a scouring machine, within which are beaters which drive the grains against the rough interior in order to free them of such substances.

The wheat is then conditioned by being subjected to heat and water and left to stand in bins from 24 to 72 hours, according to the kind of wheat. This process softens the cells and toughens the bran coating, so that it will not break up into too fine particles. When this process is completed, the wheat is again scoured and is then ready for milling.

By the process of milling wheat is ground and the product is separated into flour and feed in the proportions, roughly, of 67 to 75 of the former and 33 to 25 of the latter. At first the wheat berries are repeatedly passed through grooved iron rollers adjusted to revolve at different speeds, so as to crush and tear the grains as they pass and so at each successive passing to wear them down. Each time that the partially ground product comes from a set of rollers it is sifted and the coarser parts, such as bran, which are used for feeds, are separated from the middlings, or grits, which are ground into flour.

When the middlings have been sufficiently purified of the bran particles or feeds they are repeatedly passed through sets of smooth rollers, each successive set being closer together than the preceding. Both flour and middlings come from each set of rollers and are separated by sifting before the middlings pass on to another set, and eventually all the middlings are ground down to flour and a fine branny material, which is thrown into the feeds.

Each time the stock is sifted, whether coming from the grooved or smooth rollers, a flour stream is produced, and it is according to the disposition made of these streams that the various grades of flour result.

The wheat products as adopted by feed-control officials are defined as follows:[1]

Wheat bran is the coarse outer covering of the wheat kernel as separated from cleaned and scoured wheat in the usual process of commercial milling.

Standard middlings consists mostly of fine particles of bran, germ, and very little of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual commercial process of milling and shall not contain more than 9.5 per cent crude fiber.

Flour middlings shall consist of standard middlings and red dog flour combined in the proportions obtained in the usual process of milling and shall not contain more than 6 per cent crude fiber.

Red dog flour consists of a mixture of low-grade flour, fine particles of bran, and fibrous offal from the "tail of the mill" and shall not contain more than 4 per cent crude fiber.

Brown shorts (red shorts) consists mostly of the fine particles of bran, germ, and very little of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual commercial process of milling.

Gray shorts (gray middlings or total shorts) consists of the fine particles of the outer bran, the inner bran or bee-wing bran, the germ, and the offal or fibrous materials obtained from the "tail of the mill." This product must be obtained in the usual process of commercial milling.

[1] Directory of Ohio Flour Mills, 1923, pp. 94-95.

White shorts or white middlings consists of a small portion of the fine bran particles and the germ and a large portion of the fibrous offal obtained from the "tail of the mill." This product must be obtained in the usual process of flour milling.

Wheat mixed feed (mill-run wheat feed) consists of pure wheat bran and the gray or total shorts or flour middlings combined in the proportions obtained in the usual process of commercial millings.

Wheat bran and standard middlings consists of the two commodities as defined above, mixed in the proportion obtained in the usual process of commercial milling.

Screenings consists of the smaller imperfect grains, weed seeds, and other foreign materials having feeding value separated in cleaning the grain.

Scourings consist of such portions of the cuticle, brush, white caps, dust, smut, and other materials as are separated from the grain in the usual commercial process of scouring.

Section 6. Commercial grades of wheat flour.

The grades of wheat flour most commonly sold are patents, straights, clears, and low grade.

Patents are made of the purified middlings, the flour streams used coming only from the smooth rollers. Its quality is designated by the proportion of the total flour content of the wheat from which it is made. The limitations of a patent flour are not clearly defined and millers themselves sometimes disagree as to whether a flour is a patent. The situation was summed up in a Federal case, Lexington Mill & Elevator Co. *v.* United States,[2] a few years ago, the court pointing out that "by 'patent flour' is meant flour containing less than the total of the flour content of the wheat," and that "there is no fixed standard as to the percentage of the flour content which may be properly termed patent flour."

Continuing, it pointed out as follows:

When the process first originated, a relative low percentage was called patent flour; as improvements were made in the methods of manufacture, a higher percentage was customarily so labeled. Different mills adopt different standards, varying in accordance with the efficiency of their methods of manufacture. The quality of the wheat milled also enters into the question. The better the wheat the higher the percentage of the flour content that may properly be classed as patent flour. The case of the Government rests entirely on the evidence of some millers that in their opinion no greater percentage than 85 per cent can be properly classed as patent flour. This evidence is based upon the experience of those witnesses with different machinery and wheat, and is not predicated upon the claimant's methods of manufacture. There is a concurrence of the witnesses that the term "patent flour" does not connote any fixed or maximum percentage of the flour content of the berry.

In general, patent flours range from about 60 per cent to 90 per cent, but 85 per cent is usually the maximum and is known as standard patent. In making an 85 per cent patent the distribution of 100 pounds of flour produced is 85 pounds of patent, 10 pounds of clears, and 5 pounds of low grade. A short patent may contain only 60 per cent to 70 per cent of the total flour content and is a much more concentrated flour than the standard patent.

A clear flour is a grade between patent and low grade, being not good enough for the former and better than the latter.

Where the miller makes a patent flour that part of the flour which does not go into the patent goes into the clears and low grade; consequently when a standard patent is produced the proportion of the

[2] 202 Fed. 615 (circuit court of appeals, eighth circuit, Jan. 23, 1913).

clears is decreased and when a short patent is made the quantity of the clears is increased. A short patent is higher in grade than a standard patent and a long clear is higher than a short clear.

In describing red dog the Miller's Almanack states:[3]

> As to second clear and red dog—they are so close in quality that some mills run them together; but where second clear is made, it usually runs about 3 per cent, while red dog will run from 5 to 10 per cent, the percentage varying according to the method of milling shorts. Some mills regrind the shorts and, in fact, regrind the bran, making a large stream of red dog.

A straight flour is the result of mixing all the flour streams except the low grade; in other words, a mixture of the patents and clears is all the flour obtained after the feed and low grade have been removed. There may be variations of a straight flour, as a "cut" straight, from which a small percentage of the patent has been removed. A 50 per cent cut straight flour is made by taking out 50 per cent of the patent (containing 80 per cent of the flour content) and running the other 50 per cent with the clears, so that of 100 pounds of flour produced 58 pounds are cut straight, 40 pounds patent, and 2 pounds low grade. Again, a small per cent of clears may be added to a straight flour, the result being a "filled" or "stuffed" straight, which may be practically the same as a cut straight, as the addition of clears, which are of lower grade than the straight and patent, may reduce the straight to the same quality as is produced by the extraction of a given quantity of patent flour.

Low grade, as the name signifies, is an inferior flour and is the flour leavings after the patents, clears, and straights have been sifted out. The low grade produced in grinding is ordinarily 5 per cent of the total flour, so that when a straight flour is made 95 pounds of 100 are straight and 5 pounds are low grade.

These proportions vary considerably for different mills, and they also vary according to the quality of the wheat ground. As stated in the Miller's Almanack:[3]

> These percentages vary in every mill, and there is no fixed basis to go on. A mill which is thoroughly equipped with cleaning and milling machinery of the latest type can produce a 75 per cent patent more easily than can the poorly equipped mill produce a 65 per cent patent. * * * Further, the percentage of patent will vary in every mill every day, this resulting from a variation in wheat which comes in.

Another flour, in the process of the manufacture of which no separation of feed and flour takes place, is called graham flour. It is simply the result of grinding the cleaned wheat to a moderate degree of fineness. Whole, or entire, wheat flour is prepared by a process somewhat similar to that used in making graham flour, except that after the wheat has been cleaned and before it is ground it is subjected to a mechanical process whereby the three outer layers of the berry are removed, and leaving what is known as the cerealin to be ground with the gluten and flour cells.

[3] The Miller's Almanack and Yearbook, 1923, p. 40.

Chapter II

PRODUCTION AND FOREIGN TRADE

Section 1. Growth of flour milling in the United States.

In the preceding paragraphs reference has been made to the gradual extension of the use of the gristmill as the pioneer settlers in the various States occupied desirable arable lands. Under such circumstances the production of flour was practically limited to the quantity necessary to sustain the local population. All mills were essentially neighborhood mills and only limited quantities of flour were sold in other markets.

Later, however, the rapid development of the large wheat-growing areas in the Prairie States together with the introduction of the purifier and the invention of rolls all combined to facilitate the construction of larger units manufacturing a standardized and uniform product which could be offered for sale in distant domestic and foreign markets. The transition to the present system, therefore, was a gradual growth.

The reports of the Census Bureau are the chief source of information regarding the development of the milling industry since the middle of the nineteenth century, and a statement of the number of mills from 1850 to 1921 is shown in the following table:

Table 3.—*Number of merchant and custom flour and grist mills, 1850–1921*

Census year	Merchant flour mills	Flour and grist mills		
		Merchant mills	Custom mills	Total
1850				11,891
1859				13,868
1869				22,573
1879				24,338
1889				18,470
1899		9,476	15,782	25,258
1904	7,685	10,051		
1909	7,342	11,691	11,961	23,652
1914	6,876	10,788		
1919	6,733	10,708	10,427	21,135
1921	4,809	8,019		

A merchant mill is one that purchases grain and then sells the products after grinding, whereas a custom or neighborhood mill grinds the customer's grain for a fixed charge which may be taken as cash or in kind. The number of merchant mills was not shown separately prior to 1899.

Many of the merchant mills do not grind wheat. In 1904 the merchant wheat flour mills numbered 7,685, and since that year the number has steadily declined to only 4,809 in 1921. The marked decline in 1921 was partly due to the fact that the Census Bureau enumerated only those mills having products of $5,000 value and over, while for earlier years the minimum was $500.

The total number of mills increased from 11,891 in 1850 to 24,338 in 1879, and then declined to 18,470 in 1889.

At the end of the nineteenth century, the total number of mills attained its maximum. Approximately 40 per cent were merchant mills, while the remainder were custom mills. The number of custom mills declined from 15,782 in 1899 to 10,427 in 1919, while the number of merchant flour and grist mills reached its maximum of 11,691 in 1909, after which there was an uninterrupted decline to 8,019 in 1921.

The Census shows in 1919 that the total value of all grain products milled in the United States amounted to about $2,147,000,000, of which over $1,450,000,000 was wheat flour. Based upon the total value of all manufactured products the milling industry ranked sixth. In that year nearly 619,000,000 bushels of wheat, 137,000,000 bushels of corn, 76,000,000 bushels of oats, 28,000,000 bushels of barley, 17,500,000 bushels of rye, 5,500,000 bushels of buckwheat, and 4,000,000 bushels of other grains were ground.

The following table shows the quantity of wheat ground, and the quantity and value of flour produced in the specified years by merchant mills and by all mills:

TABLE 4.—*Quantity of wheat ground and quantity and value of wheat flour produced by merchant mills and by all mills for census years 1899-1921*

Census year	Wheat milled		Quantity of flour produced		Value of flour produced	
	Merchant mills	All mills	Merchant mills	All mills	Merchant mills	All mills
	Bushels	*Bushels*	*Barrels*	*Barrels*	*Dollars*	*Dollars*
1899	471,306,986	489,914,004	99,763,777	103,524,094	333,997,686	348,183,800
1904	494,095,083	(1)	104,013,278	(1)	480,258,514	(1)
1909	496,480,314	503,468,556	105,756,645	107,108,461	550,116,254	557,814,979
1914	545,728,431	(1)	116,403,770	(1)	543,839,568	(1)
1919	612,562,471	618,667,518	132,465,604	133,670,672	1,436,444,111	1,450,353,051
1921	521,233,509	(1)	110,846,277	(1)	871,731,990	(1)

[1] Data not shown.

The value of flour produced by all mills increased from about $348,200,000 in 1899 to over $1,450,000,000 in 1919. A large part of this increase in value was due to the higher value per barrel. For example, in 1899 the average per barrel was $3.36 while in 1919 it was $10.85.

The quantity of flour produced by all mills increased from about 103,525,000 barrels in 1899 to the maximum of 133,670,000 in 1919; this represented an increase of about 30 per cent. Although there was an increase in the total quantity of wheat ground the proportion produced by custom mills declined from 3.6 per cent in 1899 to less than 1 per cent in 1919.

Section 2. Wheat flour production by States.

The census has reported the production of merchant flour mills by States, beginning with the 1909 census. The quantity of wheat ground by merchant mills increased from 496,500,000 bushels in 1909 to a maximum of 612,600,000 bushels in 1919, and then decreased to 521,200,000 bushels in 1921. The importance of custom mills has steadily declined until in 1919 the quantity of wheat ground by them was only 6,100,000 bushels or about 1 per cent of the total for all

mills. The quantity of wheat ground and of flour produced by States for 1921, as reported by the census, is shown in the following table:

TABLE 5.—*Quantity of wheat ground and of flour produced by States, 1921*

State	Wheat ground	Flour produced	Per cent	
			Wheat	Flour
	Bushels	*Barrels*		
Minnesota	111,619,978	23,733,071	21.4	21.4
Kansas	82,389,905	17,337,406	15.8	15.7
New York	37,880,384	8,393,930	7.3	7.6
Missouri	28,945,493	6,270,366	5.6	5.7
Illinois	23,991,908	5,214,574	4.6	4.7
Washington	21,021,447	4,470,253	4.0	4.0
Texas	18,540,482	4,008,777	3.6	3.6
Ohio	18,513,767	3,844,424	3.6	3.4
Indiana	15,749,167	3,253,703	3.0	3.0
Pennsylvania	14,800,686	3,007,330	2.8	2.7
Oklahoma	12,705,228	2,780,783	2.4	2.5
Oregon	11,538,248	2,527,866	2.2	2.3
Nebraska	11,151,284	2,341,877	2.1	2.1
Tennessee	10,793,905	2,233,504	2.1	2.0
Michigan	10,118,710	2,122,073	2.0	1.9
California	9,582,278	1,974,034	1.8	1.8
Kentucky	9,489,540	2,033,138	1.8	1.8
North Dakota	9,426,847	1,994,030	1.8	1.8
Virginia	8,373,129	1,760,810	1.6	1.6
Wisconsin	7,988,165	1,701,788	1.5	1.5
Colorado	6,645,417	1,480,579	1.3	1.3
North Carolina	6,579,500	1,340,705	1.3	1.2
Montana	5,634,461	1,276,037	1.1	1.2
Iowa	4,897,944	912,086	.9	.8
Maryland	4,453,051	936,249	.9	.9
Idaho	3,675,654	787,092	.7	.7
Utah	3,478,320	741,884	.7	.7
Georgia	2,467,731	542,203	.5	.4
South Dakota	1,764,229	354,521	.3	.3
West Virginia	1,677,592	376,162	.3	.4
Other States	5,339,059	1,095,022	1.0	1.0
Total	521,233,509	110,846,277	100.0	100.0

Minnesota, Kansas, and New York, in the order named, were the three leading flour-producing States in 1921. The Minnesota flour mills grind hard spring wheat grown in Minnesota, North and South Dakota, and wheat imported from Canada. The Kansas mills grind mostly hard winter wheat grown in Kansas and bordering States, while New York mills, especially those located in Buffalo and vicinity, use large quantities of wheat imported from Canada, or grown in States farther west. Minnesota and Kansas have ranked first and second, respectively, for many years. In 1909 Illinois ranked third and New York State fourth in the quantity of wheat ground, but beginning with the 1914 census New York has been third, while Illinois has dropped to fifth place. Missouri was sixth in 1909 and fourth in 1921.

Minnesota mills alone produced over 21 per cent of the total output of wheat flour for 1921; Kansas mills produced nearly 16 per cent, New York mills about 8 per cent, and Missouri mills 6 per cent. Flour mills located in these four States produced one-half of the total production of the entire country for 1921, while 11 States produced nearly 75 per cent of the country's total.

Flour mills furnish a market for the bulk of the wheat produced in the United States. Thus the total quantity of wheat ground by merchant mills, about 521,235,000 bushels in 1921, was equivalent to approximately two-thirds of the average production for the 12-year period ending in that year.

Section 3. Concentration in the industry.

As shown above, the number of merchant flour mills decreased from 6,900 in 1914 to 4,800 mills in 1921 (the latest census enumeration), which represents a decline of 30 per cent, while the average production per mill increased from about 16,900 barrels to 23,000 barrels, or 36 per cent. About 99 per cent of the wheat flour produced in the United States is manufactured by merchant mills. The decrease in the number was due to the gradual elimination of smaller mills.

Although there were over 4,800 merchant wheat flour mills in the United States in 1921, a few companies produced a large proportion of the total output. In that year five large flour milling companies operating 49 mills and each producing in excess of 2,000,000 barrels, had an aggregate production of over 25,000,000 barrels or nearly 23 per cent of the country's total; and eight companies, with 87 mills, each producing in excess of 1,000,000 barrels, had a total production of almost 30,000,000 barrels, or 27 per cent of that total. This concentration was largely the result of the expansion of business on the part of some of the largest flour-milling concerns, although it was partly the result of the merging of different interests.

Section 4. Domestic and foreign demand.

As shown in the 1920 report, the normal domestic consumption of flour in the United States is approximately 1 barrel per capita.[1] Domestic consumption has always taken the great bulk of the flour production of this country.

Wheat flour has been exported from the United States since early colonial days. The abolition of the "corn laws" in Great Britain in 1846 greatly stimulated wheat flour exportation from this country. In 1850 about 2,000,000 barrels of flour were exported, and a few years later flour was exported from the Pacific coast to Central and South America and the Orient. During the last 13 years flour exports have taken from about 7½ to 17½ per cent of the total flour production of the country, while flour imports have been comparatively small. The quantity and value of flour exports and imports from 1911 to 1923, inclusive, are given in the following table:

TABLE 6.—*Quantity and value of wheat flour exports and imports for the fiscal years ending June 30, 1911–1923*

Year ending June 30—	Exports		Imports	
	Barrels	Value	Barrels	Value
1911	10,129,435	$49,386,946	141,582	$625,287
1912	11,006,487	50,999,797	158,777	665,346
1913	11,394,805	53,171,537	107,558	453,681
1914	11,821,461	54,454,175	89,911	363,855
1915	16,182,765	94,869,343	64,200	309,742
1916	15,520,669	87,337,805	329,905	1,689,418
1917	11,942,778	93,198,494	174,704	1,458,279
1918	21,879,951	244,861,140	675,096	6,372,333
1919	24,181,979	267,966,269	37,140	375,911
1920	21,651,961	240,574,670	159,056	1,806,546
1921	16,179,956	154,524,355	1,420,884	13,591,484
1922	15,796,824	97,386,131	619,105	3,559,501
1923	14,882,714	83,991,002	429,421	2,307,861

[1] Report of Federal Trade Commission on commercial wheat floor milling, p. 14.

The quantities exported increased from 10,129,000 barrels in the fiscal year 1911 to 16,183,000 barrels in 1915, and to a maximum of 24,182,000 barrels in 1919. Since then the export sales have decreased and the quantity for the fiscal year 1923 was only 14,883,000 barrels. During the three fiscal years, 1918–1920, about 67,500,000 barrels, or an annual average of 22,500,000 barrels, were exported, which is approximately 20 per cent of the present annual production for the entire country. The average quantity exported was much smaller for the three fiscal years, 1921–1923, than for the preceding three-year period, but it was 50 per cent larger than for the three years immediately preceding the World War. The value of the exports, which was about $49,387,000 in 1911, increased rather steadily until the maximum amount of $267,966,000 was reached in 1919, since which time a marked reaction has set in and the value declined to $83,991,000 in 1923. The average export price per barrel in the fiscal year 1911 was almost $5, while the maximum reached in 1919 was a little over $11 per barrel. In the fiscal year 1923 the average was about $5.65 per barrel.

In addition to the foreign demand for flour, as outlined in the preceding paragraph, mention should also be made of the exports of wheat. The quantity of domestic exports of wheat for the fiscal year ending June 30, 1919, was 178,583,000 bushels, for the next year 122,431,000 bushels, and for 1921 the quantity increased to 293,261,000 bushels. It then declined to 208,321,000 bushels in 1922, and to 154,951,000 bushels in 1923. For the five fiscal years ending June 30, 1923, the total quantity of wheat flour exported from the United States was nearly 92,695,000 barrels, while the quantity of wheat exported was equivalent to about 212,800,000 barrels of flour.

During this 5-year period almost 70 per cent of the combined wheat and wheat flour exports were in the form of wheat. This large demand for the raw material from which flour is manufactured rather than the flour itself is partly due to the fact that some nations seek to develop the milling industry within their own borders by laying a heavy import duty on foreign manufactured flour, while wheat may be admitted free or practically free of duty.

Practically all of the wheat flour imported into the United States comes from Canada. During the fiscal years 1911–1915 imports of wheat flour were small. In the war years 1916 and 1918 imports were much larger, while the maximum quantity of 1,420,000 barrels was imported during the fiscal year ending June 30, 1921. Although a duty of 20 per cent ad valorem was imposed upon flour imports in the emergency tariff law signed May 27, 1921, and a duty of $0.78 per hundred pounds was provided for in the McCumber-Fordney law signed September 21, 1922, flour is still imported in considerable quantities.

Canadian wheat may be imported into the United States by flour milling concerns, ground into flour, and exported without being subject to the duty of 30 cents per bushel under the provisions of the present tariff law. Any flour or by-product made from such wheat is subject to the duty, however, if it is subsequently sold for domestic consumption. These provisions are (1) the milling provision, under which the entire mill or a portion of the mill is operated under bond; all products manufactured by the bonded portion must be exported; (2) the drawback provision, under which the prescribed duty is paid

at the time of importation and later a refund of 99 per cent of the duty is made when the flour and by-products are exported, provided that at least 30 per cent of wheat grown in the United States was mixed with the imported wheat before being ground. A recent report of the United States Department of Agriculture states that nearly 50 per cent of the wheat imported from Canada into the United States since the emergency tariff became effective May 28, 1921, was imported in bond, ground into flour, and exported. The report also states that:

All of the Canadian wheat reported as having been milled in bond was milled under the milling provision. Canadian wheat milled in bond is statistically included in the general imports of the United States. All calculations, therefore, of imports of Canadian wheat that enter the United States for consumption should make allowance for the wheat milled in bond, the department points out. Flour manufactured from imported wheat is statistically included in the exports of domestic flour. Two flour mills in the United States grind Canadian wheat in bond. Both of these mills are located in the Buffalo district.

Flour exports are made to all parts of the world. During the four-year period 1911–1914 the United Kingdom, Hongkong, Japan, the Netherlands, Cuba and other islands of the West Indies, Brazil, and Central American countries took the bulk of the flour exported from the United States. Hongkong is, of course, an important Chinese seaport. In the last two war years the Allies took the great bulk of flour exports.

For the fiscal year ending June 30, 1919, both the quantity and value of flour exports were larger than for any other fiscal year in the entire history of the country. During the first six months of this fiscal year the heavy war demand stimulated exportation. The United Kingdom alone took practically 45 per cent of the total, France and Italy combined an additional 25 per cent, while the Netherlands and Cuba were the only other countries importing large quantities.

Beginning with 1920 there have been important changes in the distribution of flour exports. Exports of flour to the United Kingdom decreased to less than 2,000,000 barrels in 1923. Exports to France, which were nearly 4,000,000 barrels in 1919, had almost disappeared by 1923; in fact the quantity exported to France in the latter year was so small that it was not shown separately. On the other hand, exports to Germany, which were negligible in 1919, aggregated almost 2,000,000 barrels in 1921, over 1,500,000 barrels in 1922, and a little over 1,000,000 barrels in 1923. China, including Hongkong, and the Philippines, which purchased large quantities of flour in the United States in pre-war years but bought very little flour during the war, became important customers during the last two years. Japan, which was a large pre-war importer of American flour, has bought very little since the war. Cuba, Haiti, and other islands of the West Indies have been steady customers of American flour mills. Brazil is the only South American country that is now buying important quantities of flour from the United States. Appendix, Table 1, page 105, shows the quantity and value of flour exports by countries of destination, by fiscal years ending June 30, for the period 1919–1923.

Chapter III

INVESTMENT AND PROFITS

Section 1. Source of information.

The information covering investment and profits for the period 1919–1922 was secured either directly from the books of flour-milling concerns by the commission's examiners or was furnished by the companies on report forms supplied by the commission. In order to ascertain the facts with regard to both large and small mills report forms were sent to all mills reported as having a daily capacity of 400 barrels or over, and in some cases to mills of much smaller capacity. Report forms were sent to a total of 563 concerns (operating an even larger number of mills), and returns were obtained from 228 companies. Over 100 concerns were excused from making reports for various reasons. Nearly one-half of this number had closed down or were no longer grinding wheat, and 50 others, including some important concerns, signified their willingness to furnish the information if they could be given assistance in the preparation of their reports. This requested assistance could not generally be furnished due to lack of funds. No reply was received from about 150 companies.

Of the 228 concerns from which reports were secured 108 contained complete information covering costs, investment, and profits, 72 furnished sufficient information covering company investment and profits, while 48 either covered less than two years or were otherwise incomplete. No reports were used in the data presented here, unless they covered milling operations for two years or longer.

The report forms sent to the flour-milling industry by the commission called for cost statements, as well as balance sheets and profit-and-loss statements. In many cases, however, the companies furnished the latter without including any cost statements; consequently the data for investment and profits cover a larger number of concerns and a larger proportion of the industry than that presented for costs. In 1922, for example, the companies for which investment and profits are shown included 37 per cent of the capacity and about 50 per cent of that year's total production.

Section 2. Attitude of the Millers' National Federation.

Soon after the commission sent its report form to flour-milling concerns the attorneys for the Millers' National Federation advised the secretary of the federation regarding the course to pursue with reference to the commission's inquiry. In submitting their opinion to the secretary of the federation the attorneys said in part:[1]

You will thus see there are two questions, the legal, which we have endeavored to answer, and the practical, which we leave to each miller individually, taking into account the comparative time, trouble, and damage of answering or not answering the questionnaire, or affording the information desired, or any part of it. The long and short of it is that any miller has a right to refuse to answer the questionnaire, or any part, and to afford no information unless he chooses;

[1] Northwestern Miller, Nov. 29, 1922, p. 982.

but if he desires to accord some information he can give it when, how, and as he pleases, but we would advise that under no circumstances the emissaries or representatives of the Federal Trade Commission, or any outsider, be given access to millers' books, papers, or documents, or be permitted to take any information or copies.

Although this advice was given wide publicity, practically every company requested, including the members of the federation, disregarded it and cooperated heartily in sending in the data requested or in assisting the commission's examiners in the preparation of reports. They are to be congratulated upon their breadth of vision in voluntarily cooperating in a matter of public service.

Section 3. Principal milling districts.

For the purposes of this inquiry the country was divided into five districts, namely, northwestern, southwestern, southeastern, central and eastern, and mountain and coast. This grouping is primarily a geographical one, but in deciding the States to be included in each group consideration was also given to the character of the wheat produced in those States. The States included in the northwestern district produce chiefly hard spring wheat, most of the States in the southwestern district raise hard winter wheat mainly, the central and eastern and southeastern groups grow soft winter wheat, while the Pacific Coast States grow mostly white wheats.

Usable schedules were received from companies operating mills in 30 States (including the District of Columbia), consequently only those States have been classified. The five districts discussed in this report, with the States included in each, are shown in the following table:

TABLE 7.—*States included in the five flour milling districts*

Northwestern	Southwestern	Southeastern	Central and eastern	Mountain and coast
Iowa.	Arkansas.	District of Columbia.	Illinois.	California.
Minnesota.	Kansas.	Georgia.	Indiana.	Colorado.
Montana.	Missouri.	Kentucky.	Ohio.	Idaho.
North Dakota.	Nebraska.	Maryland.	New York.	Oregon.
Wisconsin.	Oklahoma.	North Carolina.	New Jersey.	Utah.
	Texas.	Tennessee.	Pennsylvania.	Washington.
		Virginia.		

These five districts were further subdivided into two groups each according to whether their business years ended June 30 or December 31, or approximately those dates.

Section 4. Flour-mill accounts.

When the commission's report form was sent to flour-milling concerns some of the millers and certain trade journals complained of the amount of labor and time which would be required to compile the information requested. A number of companies having good accounting records returned complete schedules within a few days. In order to ascertain the facts they were asked to report the time required to compile the reports. The time reported ranged from 20 to 48 hours for one man. The commission's examiners visited a number of the larger flour-milling concerns and the time required to

secure complete reports was about the same as that reported by the above-mentioned mills.

It was difficult to secure complete reports for some companies because it was impossible to obtain readily the actual number of bushels and the value of the purchases of wheat that went into the mill, or the actual number of barrels of wheat flour produced. The value of the sales for some companies included the value of the sales of both flour and feed. In such cases it was necessary to separate the two on some equitable basis or to ascertain the quantities and values from the invoices. The item of package cost, which is the largest single item of total mill cost (see p. 69) except wheat was not always shown separately for flour and feed. Some millers charged interest paid into their milling costs, whereas good accounting practice excludes all interest from direct manufacturing cost and treats interest actually paid as a financial item in profit and loss.

Section 5. Method of computing investments and profits.

INVESTMENT.—The investment of the companies covered in this report is shown on two different bases, namely, milling investment and company investment. The mean investment—that is, one-half of the sum of the investment at the beginning and at the end of each year—has been taken as the investment for the year. In the case of notes payable, however, the monthly average has been used instead of one-half of the amount at the beginning and end of the year. Inventory valuations and depreciation charges have been accepted as reported by the company. The two different kinds of investment shown are as follows:

1. *Milling investment*, which is the investment in the milling business of the company (it being impossible to separate the flour-milling investment from total milling investment), was computed from the liabilities side of the balance sheet, and consists of the capital stock, bonds, other borrowed money, surplus, and special reserves, such as dividends declared and not paid, and reserves for contingencies and for Federal taxes. Appreciation and good will were deducted to get the actual investment of the company.[2] From the figure thus obtained outside investments were deducted to obtain the milling investment of the company. Reserves for depreciation and bad debts were treated as deductions from plant account and accounts receivable, respectively.

2. *Company investment*, which is the investment that the stockholders collectively as a company have in the business, was obtained by deducting the bonds and other borrowed money from the milling investment, but adding back thereto the outside investments.

INCOME.—The operating profit of the company from its flour-milling business was obtained by deducting the cost of sales (including selling expense) from the value of flour sold. The profit on feed was treated as a credit to costs, and hence was taken up in the cost of sales. The profit or loss on coarse grains and on the other activities of the company was added to or deducted from its operating profit to obtain the profits from its milling business. Inasmuch as two kinds of invest-

[2] In the case of one important company its various subsidiary milling companies paid rentals to the holding company for the mills they operated, so that to enable a segregation of the mill operations geographically the total investment was divided among the several mills; appropriate adjustments were made with respect to the rentals in their income accounts. Similar adjustments were also made for two other companies.

ment are shown, two kinds of profits corresponding thereto were computed as follows:

1. *Milling net income*, which is the profit received by the company from all sources except outside investments, was used for computing return on milling investment. To obtain the milling profit, all the miscellaneous gains and losses (before deducting interest on bonds and other borrowed money) were added to or deducted from the total operating profit of the company according to whether they showed a gain or a loss. The income from outside investments was then deducted to obtain the milling profit.

2. *Company profit*, which is the net income that accrues to the stockholders collectively as a company before the payment of income or profits taxes, was obtained by deducting the interest on bonds and other borrowed money from the milling profit and adding back thereto the income from outside investments.

Milling investment and profits are shown for 108 different companies (107 being the maximum in any one year), whereas the company investment and profits are shown for 182 different companies (173 being the maximum in any one year).

Section 6. Monthly fluctuations in borrowed funds.

Considerable amounts of borrowed money are used in the milling business. These are largely short term loans and fluctuate from month to month, being lowest in the middle of the calendar year when the quantities of wheat and flour carried on hand by the milling companies are lowest.

The monthly fluctuations of 121 flour milling companies are shown in the following table:

TABLE 8.—*Monthly borrowings of 121 flour milling companies, 1919-1921*

Month	1919	1920	1921	Total	Index numbers
January	$84, 681, 316	$147, 936, 760	$72, 924, 435	$305, 542, 511	132
February	77, 619, 121	133, 385, 419	64, 147, 932	275, 152, 472	119
March	83, 151, 237	110, 157, 927	52, 382, 761	245, 691, 925	106
April	75, 335, 657	95, 451, 805	40, 446, 027	211, 233, 489	91
May	53, 847, 413	74, 267, 170	33, 689, 192	161, 803, 775	70
June	34, 402, 057	55, 583, 758	29, 822, 558	119, 808, 373	52
July	47, 853, 879	53, 786, 181	32, 361, 623	134, 001, 683	58
August	90, 862, 680	59, 047, 228	41, 430, 256	191, 340, 164	83
September	123, 795, 217	78, 078, 959	55, 037, 207	256, 911, 383	111
October	134, 378, 724	89, 357, 667	62, 044, 683	285, 781, 074	124
November	144, 303, 723	88, 870, 798	60, 549, 864	293, 924, 385	127
December	148, 443, 655	82, 991, 562	57, 829, 515	289, 264, 732	125
Averages	91, 572, 890	89, 076, 269	50, 222, 171	230, 871, 331	100

The above table shows that for the three years combined the lowest borrowings were in June and July, and that May, June, July, and August were the four lowest months. During each year there was a wide variation between the highest and lowest months. The largest monthly total for the three years combined was 155 per cent greater than that for the smallest monthly total. The three-year fluctuations are probably fairly representative, for part of the period wheat prices were very high and part of the period they were low. In times of high prices, of course, the amount of money borrowed to carry high-priced grain and high-priced flour would naturally be larger than when wheat prices are low.

The table shows that for the three years combined the borrowings were heaviest during the six months beginning with September and lightest during the preceding six months.

Section 7. Milling investment, net income, and rate of return.

As has already been shown (sec. 5), the milling investment was obtained by deducting the outside investments from the total investment. The effect of the inclusion of outside investments on the investment, net income, and rate of return of the milling companies would be so slight that it is unnecessary to discuss at length both total investment and milling investment and the return on each. As the milling investment is the investment of special interest to the millers and those studying the milling business, brief mention only is made of the total investment, the main discussion being based upon the milling investment, net income, and rate of return thereon.

It is of interest to note the return on outside investments, however, and the effect of outside investments on the milling investment of the milling companies. This is shown in the following table:

TABLE 9.—*Net income for total, outside, and milling investment, and rate of return, 1919–1922*

Item	Investment	Net income	Rate of return
1919			*Per cent*
Total investment	$181, 265, 023	$24, 362, 876	13. 4
Outside investment	13, 753, 043	1, 012, 766	7. 4
Milling investment	167, 511, 980	23, 350, 110	13. 9
1920			
Total investment	215, 161, 967	30, 678, 329	14. 3
Outside investment	12, 267, 592	535, 776	4. 4
Milling investment	202, 894, 375	30, 142, 553	14. 9
1921			
Total investment	176, 785, 756	3, 465, 091	2. 0
Outside investment	12, 088, 699	877, 490	7. 3
Milling investment	164, 697, 057	2, 587, 601	1. 6
1922			
Total investment	162, 361, 263	17, 314, 031	10. 7
Outside investment	14, 264, 871	1, 211, 389	8. 5
Milling investment	148, 096, 392	16, 102, 642	10. 9
1919–1922			
Total investment	735, 574, 009	75, 820, 327	10. 3
Outside investment	52, 374, 205	3, 637, 421	6. 9
Milling investment	683, 199, 804	72, 182, 906	10. 6

The above table shows that the inclusion of outside investments exerted on the whole an unimportant influence upon the rate of return except in 1921. In every year its effect was to reduce slightly the rate of return, except in the poor year of 1921, when its effect was to increase it from 1.6 per cent to 2 per cent. This was due to the fact that, although the outside investments were less than 7 per cent of the total investment in that year, the rate of return thereon was 7.3 per cent, as compared with 1.6 per cent on the milling investment alone. In fact, the surprising feature disclosed by a study of the

outside investments is the high rate of return in every year except 1920, when it was only 4.4 per cent. In the other three years it varied from 7.3 per cent in 1921 to 8.5 per cent in 1922, with an average for the period of 6.9 per cent. Many of the companies had large holdings of Liberty bonds on which they received approximately 4¼ per cent interest. The large return shown above was due to the fact that two of the companies in the northwestern district had very large returns from other outside investments.

Section 8. Milling investment, net income, and rate of return, by districts.

The method of arriving at the milling investment and net income was described in section 5. The investment showed a marked increase in 1920 over 1919, but there was a considerable decrease in both 1921 and 1922 over the high year of 1920. In fact, in most of the districts the investment in 1922 was less than in 1919.

The return on investment for all districts combined showed an increase in the prosperous year 1920 over 1919, although the companies with a business year closing December 31 showed a very marked decline, as shown by the following statement:

Year	All districts			Northwestern			Southwestern		
	June	December	Average	June	December	Average	June	December	Average
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1919	13.4	16.6	13.9	13.7	13.4	13.7	15.1	21.0	16.7
1920	16.8	3.1	14.9	15.5	1.4	14.7	20.6	6.8	17.7
1921	1.3	3.2	1.6	5.1	[1] .2	4.7	[1] 2.4	6.6	[1] .3
1922	10.9	10.9	10.9	13.4	6.5	12.9	9.3	9.4	9.3

[1] Loss.

This decline in the returns from the milling business, in the case of the companies with a business year closing June 30, was not reflected until 1921, when they barely showed a profit, whereas the December 31 companies in 1921 showed a profit, although a small one, which was practically the same as for the previous year. This situation was due to conditions in the wheat flour markets. Export wheat, for instance, reached its highest price in May, 1920, and then a steady decline set in which lasted (with only a few upturns) for a year and a half, when the price was only a little more than a third of that of May, 1920. This great decline was naturally reflected in heavy inventory losses, particularly in flour, and generally resulted in an actual loss on the year's operations in which the greatest decline took place. In 1922 when prices were more stable both groups of companies showed a profit, which was 10.9 per cent in each case.

The following table shows the average milling investment, net income, and rate of return for 108 different companies (maximum in any one year 107) engaged in the flour milling business, by districts:

TABLE 10.—*Milling investment, net income, and rate of return, by districts, 1919-1922*

District	Number of companies	Investment	Net income	Rate of return	
				Per cent	Rank
1919					
Northwestern	26	$74,943,237	$10,287,051	13.7	2
Southwestern	41	39,913,773	6,658,062	16.7	1
Southeastern	9	10,526,724	1,377,642	13.1	3
Central and eastern	13	17,334,274	2,078,201	12.0	4
Mountain and coast	12	24,793,972	2,949,154	11.9	5
Total	101	167,511,980	23,350,110	13.9	--------
1920					
Northwestern	27	91,701,468	13,452,624	14.7	3
Southwestern	43	52,846,622	9,331,007	17.7	2
Southeastern	9	10,045,854	310,226	3.1	5
Central and eastern	13	17,982,784	1,520,784	8.5	4
Mountain and coast	13	30,317,647	5,527,912	18.2	1
Total	105	202,894,375	30,142,553	14.9	--------
1921					
Northwestern	26	71,823,226	3,408,693	4.7	1
Southwestern	45	45,646,555	[1] 129,622	[1] 0.3	3
Southeastern	9	7,693,273	[1] 53,924	[1] 0.7	4
Central and eastern	13	15,794,757	447,213	2.8	2
Mountain and coast	14	23,739,246	[1] 1,084,759	[1] 4.6	5
Total	107	164,697,057	2,587,601	1.6	--------
1922					
Northwestern	26	64,094,693	8,285,709	12.9	2
Southwestern	44	41,098,184	3,815,674	9.3	3
Southeastern	9	7,081,047	1,109,622	15.7	1
Central and eastern	10	12,711,194	821,258	6.5	5
Mountain and coast	12	23,111,274	2,070,379	9.0	4
Total	101	148,096,392	16,102,642	10.9	--------
1919-1922					
Northwestern	--------	302,562,624	35,434,077	11.7	1
Southwestern	--------	179,505,134	19,675,121	11.0	2
Southeastern	--------	35,346,898	2,743,566	7.8	4
Central and eastern	--------	63,823,009	4,867,456	7.6	5
Mountain and coast	--------	101,962,139	9,462,686	9.3	3
Total	--------	683,199,804	72,182,906	10.6	--------

[1] Loss.

The above table shows an average return for all districts combined of 13.9 per cent in 1918, 14.9 per cent in 1920, 1.6 per cent in the bad year of 1921, and a recovery to 10.9 per cent in 1922. The highest rate of return was in a different district in each year, southwestern in 1919, mountain and coast in 1920, northwestern in 1921, and southeastern in 1922. Conditions were more stable, however, in the large producing northwestern district, which showed next to the highest rate of return in 1919 and 1922, was third in 1920, and was highest in the very poor year of 1921, with returns of 13.7, 12.9, 14.7, and 4.7 per cent, respectively. In 1921 only one other district showed a profit, the central and eastern, with a return of 2.8 per cent. The other three districts showed losses, varying from 4.6 per cent in the mountain and coast district to 0.7 and 0.3 per cent in the southeastern and southwestern districts, respectively.

Section 9. Milling investment, net income, and rate of return, by principal States.

The two most important flour milling States are Minnesota and Kansas, although New York, Illinois, and Missouri are also large producers of flour. A study of the return on investment in these two States as compared with the country as a whole is consequently of special interest. The net income for these two States for the period is practically three-fifths of the net income for all districts, whereas the investment is only a little more than half of the total investment for all districts, so the rate of return for the two States is somewhat higher than the return for all districts combined.

The following table shows the milling investment, net income, and rate of return for the companies covered in the States of Minnesota and Kansas, compared with all other States.

TABLE 11.—*Milling investment, net income, and rate of return for the States of Minnesota and Kansas, compared with all other States, 1919-1922*

State	Number of companies	Investment	Net income	Rate of return
1919				*Per cent*
Minnesota	23	$74,361,401	$10,234,094	13.8
Kansas	17	15,057,345	2,570,524	17.1
Above States	40	89,418,746	12,804,618	14.3
Other States	61	78,093,234	10,545,492	13.5
Total	101	167,511,980	23,350,110	13.9
1920				
Minnesota	24	91,089,650	13,481,828	14.8
Kansas	17	16,872,233	4,038,765	23.9
Above States	41	107,961,883	17,520,593	16.2
Other States	64	94,932,492	12,621,960	13.3
Total	105	202,894,375	30,142,553	14.9
1921				
Minnesota	24	71,350,436	3,411,477	4.8
Kansas	17	14,656,632	231,091	1.6
Above States	41	86,007,068	3,642,568	4.2
Other States	66	78,689,989	[1] 1,054,967	[1] 1.3
Total	107	164,697,057	2,587,601	1.6
1922				
Minnesota	24	63,635,261	8,281,873	13.0
Kansas	17	14,674,443	1,294,193	8.8
Above States	41	78,309,704	9,576,066	12.2
Other States	60	69,786,688	6,526,576	9.4
Total	101	148,096,392	16,102,642	10.9
1919-1922				
Minnesota	----------	300,436,748	35,409,272	11.8
Kansas	----------	61,260,653	8,134,573	13.3
Above States	----------	361,697,401	43,543,845	12.0
Other States	----------	321,502,403	28,639,061	8.9
Total	----------	683,199,804	72,182,906	10.6

[1] Loss.

The above table shows that the rate of return for Kansas flour mills averaged slightly higher than for Minnesota. For 1919, 1920, and 1921 each of these States averaged higher than all other States combined. In 1922 Minnesota showed a higher rate of return than the other States, whereas Kansas was lower.

The State of Minnesota is the predominant flour-producing State of the country, and the rate of return for that State is practically the same as for the whole northwestern district, as reported to the commission. The rate of return varied from 4.8 per cent in the poor year of 1921 to 14.8 per cent in the year 1920, the other two years being 13 per cent or over.

The State of Kansas, which is the second most important flour-producing State in the country and the most important in the southwestern district, shows considerable fluctuation in its rate of return on investment. It increased from 17.1 per cent in 1919 to 23.9 per cent in the very prosperous year of 1920, slumping badly the next year to 1.6 per cent, but recovering to 8.8 per cent in 1922.

The other 28 States of the country covered by this table showed practically the same rate of return in 1919 and 1920, averaging a little more than 13 per cent. In the bad year of 1921 they showed a loss of 1.3 per cent, but the next year showed a profit of 9.4 per cent.

Section 10. Milling investment, net income, and rate of return, by investment groups.

For the purpose of determining the relation of the size of investment and the rate of return, the five districts have been reclassified into five groups on the basis of investment of the different companies, as follows: (1) Those with an investment of less than $250,000, (2) investments of $250,000 to $500,000, (3) investments ranging from $500,000 to $1,000,000, (4) investments from $1,000,000 to $2,000,000, and (5) companies with an investment of $2,000,000 and over. The differences in the rate of return for the different investment groups in most years is surprisingly small, although in 1920 and 1921 the lowest investment group made the poorest showing.

The following table shows the milling investment, net income, and rate of return, by investment groups:

TABLE 12.—*Milling investment, net income, and rate of return by investment groups 1919-1922*

Group	Number of companies	Investment	Net income	Rate of return	
				Per cent	Rank
1919					
Under $250,000	22	$4,096,099	$763,871	18.6	1
$250,000 to $500,000	26	8,705,903	1,290,236	14.8	4
$500,000 to $1,000,000	22	15,392,070	2,771,510	18.0	2
$1,000,000 to $2,000,000	14	19,525,175	3,028,153	15.5	3
$2,000,000 and over	17	119,792,733	15,496,340	12.9	5
Total	101	167,511,980	23,350,110	13.9	
1920					
Under $250,000	18	3,244,947	52,823	1.6	5
$250,000 to $500,000	30	10,548,600	1,039,517	9.9	4
$500,000 to $1,000,000	21	15,677,009	2,578,591	16.4	1
$1,000,000 to $2,000,000	18	24,915,058	3,402,334	13.7	3
$2,000,000 and over	18	148,508,761	23,069,288	15.5	2
Total	105	202,894,375	30,142,553	14.9	
1921					
Under $250,000	24	3,905,572	[1] 210,780	[1] 5.4	5
$250,000 to $500,000	30	10,676,493	13,208	.1	2
$500,000 to $1,000,000	23	16,893,387	[1] 447,480	[1] 2.6	4
$1,000,000 to $2,000,000	12	14,389,014	[1] 58,330	[1] .4	3
$2,000,000 and over	18	118,832,591	3,290,983	2.8	1
Total	107	164,697,057	2,587,601	1.6	
1922					
Under $250,000	24	3,814,306	319,349	8.4	4
$250,000 to $500,000	28	9,736,000	990,340	10.2	3
$500,000 to $1,000,000	22	15,786,138	1,821,471	11.5	2
$1,000,000 to $2,000,000	13	17,269,676	1,224,419	7.1	5
$2,000,000 and over	14	101,490,272	11,747,063	11.6	1
Total	101	148,096,392	16,102,642	10.9	
1919-1922					
Under $250,000		15,060,924	925,263	6.1	5
$250,000 to $500,000		39,666,996	3,333,301	8.4	4
$500,000 to $1,000,000		63,748,604	6,724,002	10.5	2
$1,000,000 to $2,000,000		76,098,923	7,596,576	10.0	3
$2,000,000 and over		488,624,357	53,603,674	11.0	1
Total		683,199,804	72,182,906	10.6	

[1] Loss.

In 1919 the group with an investment of less than $250,000 showed the highest profit, 18.6 per cent, while in the two following years it showed the lowest return, 1.6 per cent and a loss of 5.4 per cent, and in 1922 it had next to the lowest return, 8.4 per cent. It also showed the lowest return for the period with an average of 6.1 per cent. On the other hand, the group with the highest investment, $2,000,000 and over, which showed the lowest return in 1919 had the highest rate of return in 1921 and 1922, with 2.8 and 11.6 per cent, respectively, and was second in 1920, with 15.5 per cent. This group with large investment was apparently better fortified to withstand poor years in business. For the four-year period it showed a slightly higher rate of return than any other group, with an average of 11 per cent. The group with an investment ranging from $500,000 to $1,000,000 made the second best showing, with an average of 10.5

per cent for the four-year period, although there was a loss of 2.6 per cent in the poor year 1921. The other two groups showed average profits of 10 per cent or less, while the average for all groups was 10.6 per cent.

The following table compares the true and simple average rates of profit:

TABLE 13.—*Comparison between the true and simple average rate of profit on the milling investment by profit groups, 1919-1922*

Investment group	True average rate of profit	Simple average rate of profit
1919	*Per cent*	*Per cent*
Under $250,000	18.6	18.5
$250,000 to $500,000	14.8	15.5
$500,000 to $1,000,000	18.0	18.4
$1,000,000 to $2,000,000	15.5	16.8
$2,000,000 and over	12.9	13.7
Total	13.9	16.7
1920		
Under $250,000	1.6	.8
$250,000 to $500,000	9.9	10.6
$500,000 to $1,000,000	16.4	15.7
$1,000,000 to $2,000,000	13.7	14.1
$2,000,000 and over	15.5	15.8
Total	14.9	11.4
1921		
Under $250,000	[1] 5.4	[1] 9.4
$250,000 to $500,000	.1	.7
$500,000 to $1,000,000	[1] 2.6	[1] 3.1
$1,000,000 to $2,000,000	[1] .4	[1] .7
$2,000,000 and over	2.8	2.0
Total	1.6	[1] 2.7
1922		
Under $250,000	8.4	6.5
$250,000 to $500,000	10.2	10.0
$500,000 to $1,000,000	11.5	12.0
$1,000,000 to $2,000,000	7.1	5.9
$2,000,000 and over	11.6	11.5
Total	10.9	9.3
1919-1922		
Under $250,000	6.1	3.8
$250,000 to $500,000	8.4	9.1
$500,000 to $1,000,000	10.5	10.4
$1,000,000 to $2,000,000	10.0	9.8
$2,000,000 and over	11.0	10.8
Total	10.6	8.5

[1] Loss

As already explained, the true average was obtained by dividing the aggregate profits of the companies in each group by their aggregate investment, while the simple average was obtained by dividing the sum of the rates of return for all companies in a group by the number of companies.

When the true average is higher than the simple average, it was due either to (1) the larger companies in a group showing higher profits than the intermediate or smaller sized ones, or (2) certain small companies having made smaller profits or larger losses than

were shown by the larger companies, and when the opposite is the case the smaller companies were either (1) generally more prosperous or (2) certain larger companies had small profits.

In 1919 the simple average for all investment groups, excepting group 1, with an investment under $250,000, was somewhat higher than the true average rate of profit. In that year the smaller and intermediate size companies in each group generally had higher profits than the larger companies. For all companies combined the simple average was 16.7 per cent as compared with 13.9 per cent for the true average.

In 1920 the simple average for group 1, the smallest size group, group 3, the intermediate size group, and for all groups combined, was smaller than the true average. That is, the larger companies in those groups had the highest rate of profit, while in the other groups the smaller companies had the highest profits.

In 1921 three groups showed a loss for the true average and four groups and all companies combined showed a loss based on the simple average. The per cent of loss was also larger for each group and for the total based upon the simple average. As a rule, only the largest companies showed a profit.

In 1922 the true average was slightly higher than the simple average for all groups excepting the intermediate size group with investments ranging from $500,000 to $1,000,000.

Section 11. Milling investment, net income, and rate of return, by production groups.

For the period 1919–1922 the true average rate of profit was somewhat higher than the simple average for all groups combined and for each group excepting group 2. Appendix Table 2 gives a comparison of the true and simple average rate of return by size groups for each milling district.

For the purpose of determining the relation between the annual volume of production and the return upon investment, the companies were placed in five groups, as follows: (1) Companies producing less than 125,000 barrels, (2) companies producing from 125,000 to 250,000 barrels, (3) companies producing from 250,000 to 500,000 barrels, (4) companies producing from 500,000 to 1,000,000 barrels, and (5) companies producing 1,000,000 barrels or over. The difference in the rate of return for different groups was much greater than was shown when the companies were arranged by investment groups. The intermediate-sized production group had the highest average rate of return for the four-year period, 11.8 per cent, and the largest production group the second highest average rate of return, 11.5 per cent. As shown on page 36, the companies having the largest investment, as a group, had the highest four-year average return on investment, 11 per cent as compared with 10.5 per cent for those with an intermediate-sized investment.

The following table shows the annual production, milling investment, net income, and rate of return by production groups, 1919–1922:

TABLE 14.—*Production, investment, earnings, and rate of return by production groups, 1919-1922*

Production group in barrels	Production	Investment	Income	Rate of return
1919	*Barrels*			*Per cent*
Under 125,000	2,978,833	$10,849,957	$1,611,569	14.9
125,000 to 250,000	4,519,415	15,320,017	2,257,940	14.7
250,000 to 500,000	6,639,522	20,265,140	3,827,336	18.9
500,000 to 1,000,000	8,308,111	28,819,684	3,703,181	12.8
1,000,000 and over	27,517,196	92,257,182	11,950,084	13.0
Total	49,963,077	167,511,980	23,350,110	13.9
1920				
Under 125,000	3,448,521	14,913,933	769,305	5.3
125,000 to 250,000	3,470,625	13,173,916	1,606,931	12.2
250,000 to 500,000	8,082,287	29,152,893	5,093,454	17.5
500,000 to 1,000,000	5,063,109	20,887,539	3,175,553	15.2
1,000,000 and over	31,120,310	124,766,094	19,470,310	15.6
Total	51,184,852	202,894,375	30,142,553	14.9
1921				
Under 125,000	2,849,124	12,460,376	[1] 694,929	[1] 5.6
125,000 to 250,000	4,483,209	16,416,476	[1] 593,930	[1] 3.6
250,000 to 500,000	6,847,091	24,001,478	298,537	1.2
500,000 to 1,000,000	4,523,493	19,022,320	[1] 453,026	[1] 2.4
1,000,000 and over	27,531,290	92,796,407	4,030,949	4.3
Total	46,234,207	164,697,057	2,587,601	1.6
1922				
Under 125,000	2,813,447	9,678,888	725,798	7.5
125,000 to 250,000	3,340,329	11,158,745	929,512	8.3
250,000 to 500,000	8,557,779	22,073,703	2,036,313	9.2
500,000 to 1,000,000	6,309,748	20,972,191	2,643,706	12.6
1,000,000 and over	29,127,002	84,212,865	9,767,313	11.6
Total	50,148,305	148,096,392	16,102,642	10.9
1919–1922				
Under 125,000	12,089,925	47,903,154	2,438,743	5.1
125,000 to 250,000	15,813,578	56,069,154	4,200,079	7.5
250,000 to 500,000	30,126,679	95,493,214	11,255,640	11.8
500,000 to 1,000,000	24,204,461	89,701,734	9,069,414	10.1
1,000,000 and over	115,295,798	394,032,548	45,218,656	11.5
Grand total	197,530,441	683,199,804	72,182,906	10.6

[1] Loss.

In 1919 the companies having the smallest production made their best showing with average earnings of 14.9 per cent, which was exceeded only by the group with intermediate production. The two groups with the largest production had the smallest rate of return.

In 1920 the group with the smallest production had much the smallest return on investment, only 5.3 per cent. The intermediate size group had the highest average rate of return, 17.5 per cent. The two largest groups ranked second and third, with average earnings in excess of 15 per cent.

As already pointed out the year 1921 was one in which many companies covered lost money. When grouped on the basis of production only two groups, the largest and intermediate size groups, showed a profit, the latter earning 1.2 per cent and the companies with the largest production 4.3 per cent. The group with the next to the largest production and the two groups with small production all showed losses, the amount of the loss increasing as the production decreased.

In 1922 the larger companies generally had the highest rates of profit. The group having the smallest production per company

earned 7.5 per cent, while the rate of profit increased with each size group to 12.6 per cent for the next to the largest companies, and then declined to 11.6 per cent for the largest production group.

Section 12. Rate of return on investment, by companies.

The rate of return by companies, ranged from low to high for each of the four years, is shown in Appendix Table 3.

The range for the year 1919 was from a loss of 11.1 per cent to a profit of 50.5 per cent. Only two companies out of the 101 presented showed a loss, and but two showed a profit of 50 per cent or over. A profit of less than 10 per cent was shown by 25 companies, while 74 companies showed a profit of over 10 per cent. The average was 13.9 per cent.

The range for the year 1920 was from a loss of 51.4 per cent to a profit of 49.2 per cent. Twenty companies showed a loss. A profit of less than 10 per cent was shown by 26 companies, while 59 companies showed a profit of 10 per cent or over. The latter companies, however, were large enough to not only offset the losses and low profits of the first group, but to raise the profits of the whole group to a slightly higher figure than in 1919, namely, 14.9 per cent.

The range in the rate of return on investment in 1921 was from a loss of 72.6 per cent to a profit of 44.1 per cent. A profit of less than 10 per cent was shown by 32 of the companies, while only 18 companies showed a profit of 10 per cent or over. The profit shown by the 50 companies which made a profit was barely sufficient to offset the losses made by the 57 other companies, the profit for the group averaging 1.6 per cent.

The range in the rate of return in 1922 varied from a loss of 32.4 per cent to a profit of 47.3 per cent. A profit of less than 10 per cent was shown by 47 companies, while only 37 companies showed a higher rate of return. Seventeen companies showed a loss. The average rate was 10.9 per cent.

Section 13. Graphic presentation of profits.

The rate of return on the milling investment for individual companies covering their four years' business for the period 1919–1922 is shown graphically in Chart 1, opposite. The data upon which this chart is based are given in Appendix Table 4, page 108. The total quantity of flour produced by these companies for the period was 197,530,441 barrels, the aggregate earnings $72,182,906, and the weighted or true average rate of return 10.6 per cent.

The companies were placed in the following five groups, depending on the size of their average investment for the period: Group 1, companies having an average investment of under $250,000; Group 2, companies with an investment of from $250,000 to $500,000; Group 3, companies with an average investment of from $500,000 to $1,000,000; Group 4, companies with an average investment ranging from $1,000,000 to $2,000,000; and Group 5, companies having an average investment of $2,000,000 and over. The group in which each company is placed is indicated by the width of the column showing the average rate of return upon investment, Group 1 having the narrowest column and Group 5 the widest. The companies were arranged consecutively from the greatest loss to the highest rate of return. The range for the four years' business was from a loss of 10.6 to a profit of 40 per cent.

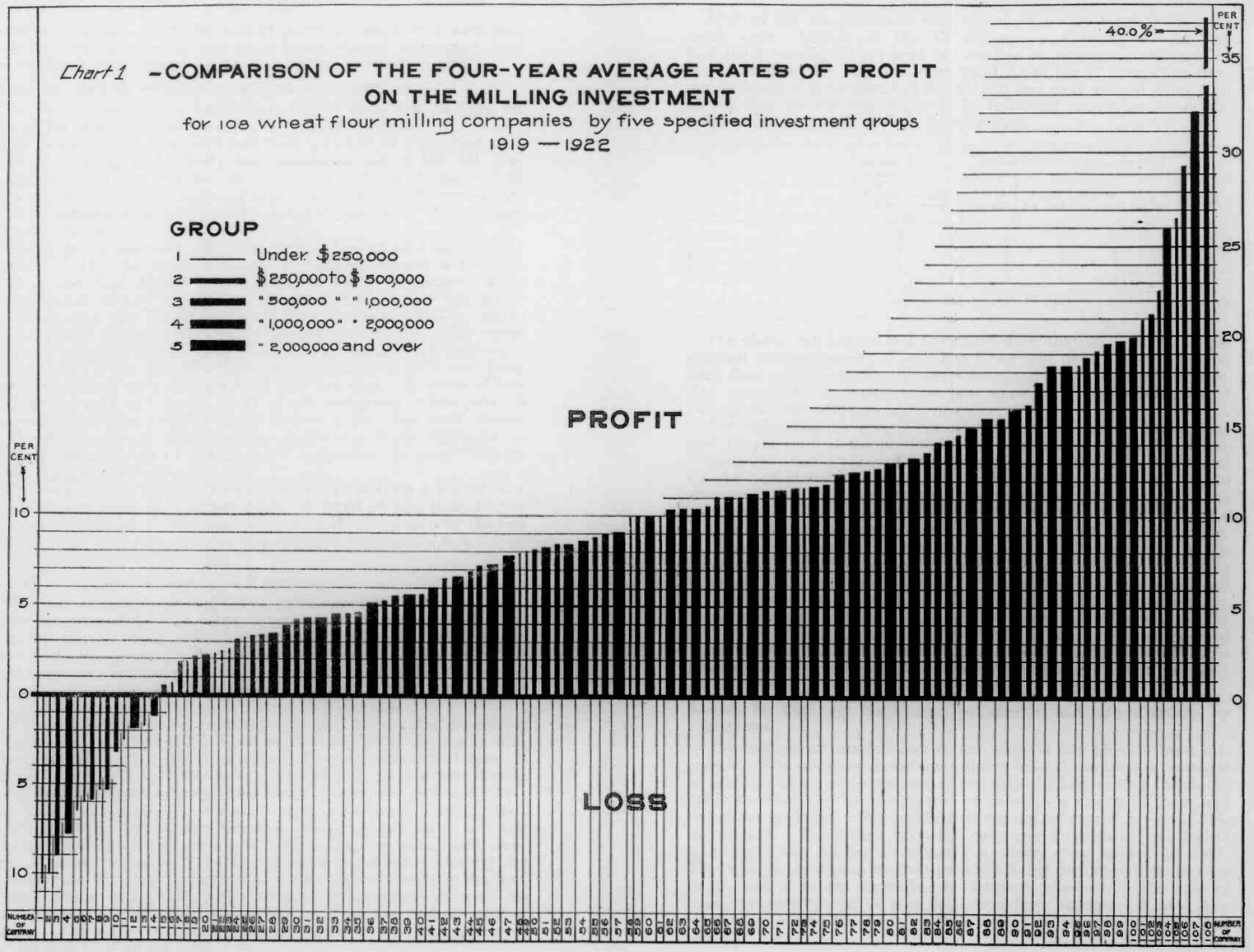


Chart 1 -COMPARISON OF THE FOUR-YEAR AVERAGE RATES OF PROFIT ON THE MILLING INVESTMENT
for 108 wheat flour milling companies by five specified investment groups
1919 — 1922
GROUP
1 Under $250,000
2 $250,000 to $500,000
3 " 500,000 " " 1,000,000
4 " 1,000,000 " " 2,000,000
5 " 2,000,000 and over
PROFIT
LOSS
PER CENT
40.0%
NUMBER OF COMPANY

Most of the companies showing a loss or a very large profit were small ones. Eleven of the 14 companies showing a loss and 6 of the 8 earning 20 per cent or over had an average investment of less than $500,000. On the other hand, 13 of the 17 companies having an average investment of $2,000,000 and over earned from 5 to 15 per cent for the four years. The following statement shows the number of companies in each profit group:

Group	Number of companies showing loss	Number of companies showing profit					
		Under 5 per cent	5 to 10 per cent	10 to 15 per cent	15 to 20 per cent	20 to 40 per cent	Total
1	7	6	3	2	1	3	22
2	4	8	8	6	2	3	31
3	2	4	2	9	5	2	24
4	1	2	3	6	2		14
5		1	7	6	3		17
Total	14	21	23	29	13	8	108

The above tabulation and the chart show that while many of the smallest companies earned less than 5 per cent or sustained a loss on their four years' business, certain small companies had large earnings. The companies of intermediate size were quite evenly distributed throughout the entire range of profits.

The companies showing a loss had 2.5 per cent of the investment and 2.5 per cent of the production for the four-year period. Those earning less than 5 per cent had 9.8 per cent of the investment and 7.7 per cent of the production. The companies earning from 5 to 10 per cent had 31.7 per cent of the investment and 29.8 per cent of the production. Companies earning from 10 to 15 per cent had 41.6 per cent of the investment and 42.1 per cent of the production. Companies earning from 15 to 20 per cent had 12.9 per cent of the investment and 15.6 per cent of the production, while those earning in excess of 20 per cent had only 1.5 per cent of the investment and 2.3 per cent of the production. Companies having 30 per cent of the total investment earned 8.1 per cent or under or had a loss for the four years, companies owning two-thirds of the investment earned 13 per cent or under; the average rate of profit on 92 per cent of the investment was 16.2 per cent or under, while companies having 1 per cent of the investment earned in excess of 25 per cent.

Section 14. Company investment, net income, and rate of return, by districts.

The milling investment and return thereon has already been discussed. The company investment differs from the milling investment in that it is based upon the money put into the business by the stockholders collectively as a company, or earnings accruing to them and left in the business. Borrowed funds are not, of course, a part of this investment. The return upon the company investment was higher than upon the milling investment in every year except in 1921. This was partly due to interest paid not being deducted from income in the case of return on milling investment, whereas, in the case of company investment, it is a deduction from income. It was also partly due to the difference in the amount of the investment. (See sec. 5.)

The following table shows the company investment, net income, and rate of return, by districts, for the same companies which have already been discussed in the case of milling investment and return thereon:

TABLE 15.—*Company investment, net income, and rate of return for companies reporting, by districts, 1919-1922*

District	Investment	Net income	Rate of return
1919			*Per cent*
Northwestern district	$47,536,260	$9,060,706	19.1
Southwestern district	28,262,034	5,821,502	20.6
Southeastern district	5,931,414	1,037,448	17.5
Central and eastern district	9,856,208	1,588,192	16.1
Mountain and coast district	17,130,115	2,394,879	14.0
Total	108,716,031	19,902,727	18.3
1920			
Northwestern district	49,890,250	10,750,942	21.5
Southwestern district	33,233,824	8,121,216	24.4
Southeastern district	5,913,452	6,066	.1
Central and eastern district	10,453,510	1,007,108	9.6
Mountain and coast district	19,733,290	5,012,521	25.4
Total	119,224,326	24,897,853	20.9
1921			
Northwestern district	49,771,648	2,340,867	4.7
Southwestern district	34,929,697	[1] 997,680	[1] 2.9
Southeastern district	5,334,568	[1] 225,738	[1] 4.2
Central and eastern district	10,385,510	110,912	1.1
Mountain and coast district	21,161,390	[1] 1,406,784	[1] 6.6
Total	121,582,813	[1] 178,423	[1] .1
1922			
Northwestern district	50,489,727	8,252,001	16.3
Southwestern district	32,789,436	3,274,044	10.0
Southeastern district	5,327,880	988,311	18.5
Central and eastern district	8,859,854	548,774	6.2
Mountain and coast district	20,504,465	1,678,876	8.2
Total	117,971,362	14,742,006	12.5
1919-1922			
Northwestern district	197,687,885	30,404,516	15.4
Southwestern district	129,214,991	16,219,082	12.6
Southeastern district	22,507,314	1,806,087	8.0
Central and eastern district	39,555,082	3,254,986	8.2
Mountain and coast district	78,529,260	7,679,492	9.8
Grand total	467,494,532	59,364,163	12.7

[1] Loss.

The above table shows an average rate of return on company investment for the four-year period of 12.7 per cent, as against a return of 10.6 per cent on the milling investment for the same companies. The return varied from a loss of one-tenth of 1 per cent in 1921 to a profit of 20.9 per cent in 1920. The northwestern district showed the highest average rate of return for the whole period, 15.4 per cent, although it had the highest rate in only one year, the poor year of 1921. The southwestern district had the second highest average rate of return for the period, although it was highest in 1919 only. In fact the highest rate of return was shown by a different district in each of the four years. Although the southeastern district had the highest rate of return in 1922, for the whole period it showed the lowest return of any of the districts, 8 per cent.

In only one year was a loss shown for any district, but in that year, 1921, three districts showed losses varying from 2.9 per cent in the southwestern district to 6.6 per cent in the mountain and coast district, the latter having had the highest rate of return in the previous year. A loss was registered by all districts combined in 1921.

In addition to the reports covering the companies which have already been discussed in connection with the milling investment and company investment, there were many reports which did not give sufficient detail to compute the rate of return on the milling investment, but which did contain sufficient information to compute it for company investment. These reports were tabulated and the results incorporated with the results already shown for the rate of return on the company investment. The effect was to lower a little the rate of return shown in the previous table. This increased the number of companies from a maximum of 107 in a single year to 173.

The following table shows the company investment, net income, and rate of return, by districts, for all companies from which reports usable for this purpose were received.

TABLE 16.—*Company investment, net income, and rate of return for all companies, by districts, 1919-1922*

District	Investment	Net income	Rate of return
1919			*Per cent*
Northwestern district	$49,760,682	$9,426,719	18.9
Southwestern district	43,626,249	8,800,451	20.2
Southeastern district	8,639,586	1,688,533	19.5
Central and eastern district	20,647,618	3,544,273	17.2
Mountain and coast district	25,024,004	3,533,330	14.1
Total	147,698,139	26,993,306	18.3
1920			
Northwestern district	52,457,677	10,994,425	21.0
Southwestern district	49,962,665	11,222,767	22.5
Southeastern district	9,137,084	560,521	6.1
Central and eastern district	21,430,257	1,415,863	6.6
Mountain and coast district	28,393,385	7,434,131	26.2
Total	161,381,068	31,627,707	19.6
1921			
Northwestern district	53,118,294	2,135,595	4.0
Southwestern district	52,171,779	[1] 1,430,662	[1] 2.7
Southeastern district	8,735,047	38,005	.4
Central and eastern district	22,250,112	[1] 86,269	[1] .4
Mountain and coast district	28,931,696	[1] 3,359,865	[1] 11.6
Total	165,206,928	[1] 2,703,196	[1] 1.6
1922			
Northwestern district	53,804,784	8,724,354	16.2
Southwestern district	48,333,410	4,669,996	9.7
Southeastern district	8,362,446	1,448,929	17.3
Central and eastern district	16,676,823	1,131,014	6.8
Mountain and coast district	27,042,520	2,179,046	8.1
Total	154,219,983	18,153,339	11.8
1919-1922			
Northwestern district	209,141,437	31,281,093	15.0
Southwestern district	194,094,103	23,262,552	12.0
Southeastern district	34,874,163	3,735,988	10.7
Central and eastern district	81,004,810	6,004,881	7.4
Mountain and coast district	109,391,605	9,786,642	8.9
Grand total	628,506,118	74,071,156	11.8

[1] Loss.

The above table shows an average rate of return for the period of 11.8 per cent as against a return of 12.7 per cent for those companies from which complete schedules were received. Of course, in the case of individual years and individual districts greater differences were shown, but there are no striking differences by years for all districts combined as compared with the previous table. In 1919 they were the same, 18.3 per cent. In 1920 the rate of profit was 19.6 per cent for the 173 companies, instead of 20.9 per cent for the 108 companies, and in 1921 the loss was 1.6 per cent for the 173 companies and 0.1 per cent for the 108 companies. In 1922 there was an even smaller difference. For each year the combined results were lower than those previously shown. For all years combined the district which showed the largest difference in rate of return was the southeastern district, which showed a rate of 10.7 per cent on this basis, instead of 8 per cent as given in the previous table.

Section 15. Cost of sales and profit per barrel.

During the war period the United States Grain Corporation allowed the millers a profit of 25 cents a barrel. The average operating profit for all districts combined for the four-year period 1919 to 1922 was $0.32 per barrel, which resulted in a milling profit of $0.36 per barrel and the company profit of $0.30 per barrel. Appendix Table 5, page 109, shows the quantity of flour sold and the amounts of the receipts, the cost of sales, and profits, by districts, 1919–1922.

The following table shows the cost of sales, selling expense, value of sales, and profit per barrel, by districts:

TABLE 17.—*Cost of sales, value of sales, operating profit, milling profit, and company profit per barrel, by districts, 1919–1922*

District	Cost of flour sold			Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Company profit
	Cost of sales	Selling expense	Total						
1919									
Northwestern	$10.10	$0.29	$10.39	$10.74	$0.35	$0.01	$0.36	$0.04	$0.32
Southwestern	9.61	.15	9.76	10.26	.50	.07	.57	.07	.50
Southeastern	10.34	.17	10.51	11.10	.59	[2] .06	.53	.13	.40
Central and eastern	10.26	.22	10.48	11.03	.55	.05	.60	.14	.46
Mountain and coast	9.49	.09	9.58	10.03	.45	.26	.71	.13	.58
Total	9.96	.23	10.19	10.61	.42	.05	.47	.07	.40
1920									
Northwestern	11.31	.40	11.71	12.12	.41	.07	.48	.10	.38
Southwestern	10.50	.23	10.73	11.33	.60	.11	.71	.09	.62
Southeastern	11.25	.25	11.50	11.70	.20	[2] .05	.15	.15	-------
Central and eastern	11.25	.33	11.58	11.98	.40	.06	.46	.15	.31
Mountain and coast	9.86	.11	9.97	10.49	.52	.54	1.06	.10	.96
Total	10.95	.32	11.27	11.73	.46	.12	.58	.10	.48
1921									
Northwestern	8.66	.47	9.13	9.34	.21	[2] .08	.13	.04	.09
Southwestern	8.38	.28	8.66	8.67	.01	[2] .02	[2] .01	.07	[2] .08
Southeastern	8.08	.25	8.33	8.25	[2] .08	.05	[2] .03	.09	[2] .12
Central and eastern	8.87	.33	9.20	9.36	.16	-------	.16	.12	.04
Mountain and coast	8.85	.19	9.04	8.74	[2] .30	[2] .01	[2] .31	.08	[2] .39
Total	8.58	.39	8.97	9.08	.11	[2] .05	.06	.06	.00

[1] Less interest paid plus income from outside investments. [2] Loss.

TABLE 17.—*Cost of sales, value of sales, operating profit, milling profit, and company profit per barrel, by districts, 1919–1922*—Continued

District	Cost of flour sold			Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid	Company profit
	Cost of sales	Selling expense	Total						
1922									
Northwestern	$6.21	$0.40	$6.61	$6.89	$0.28	$0.02	$0.30	-------	$0.30
Southwestern	5.45	.25	5.70	5.99	.29	[2] .01	.28	$0.04	.24
Southeastern	6.22	.27	6.49	6.90	.41	.10	.51	.05	.46
Central and eastern	6.77	.33	7.10	7.40	.30	.02	.32	.10	.22
Mountain and coast	5.63	.15	5.78	5.91	.13	.34	.47	.09	.38
Total	5.98	.33	6.31	6.58	.27	.05	.32	.03	.29
1919–1922									
Northwestern	9.07	.39	9.46	9.77	.31	.01	.32	.05	.27
Southwestern	8.42	.23	8.65	9.00	.35	.04	.39	.07	.32
Southeastern	9.05	.23	9.28	9.59	.31	-------	.31	.10	.21
Central and eastern	9.47	.30	9.77	10.13	.36	.04	.40	.13	.27
Mountain and coast	8.48	.13	8.61	8.84	.23	.31	.54	.10	.44
Total	8.88	.31	9.19	9.51	.32	.04	.36	.06	.30

[2] Loss.

The above table shows that the average operating profit per barrel for the four-year period by districts was very uniform, varying from $0.31 to $0.36, except in the mountain and coast district, where it was $0.23. The addition of other gains and losses, however, raised the mountain and coast district from the lowest to the highest for the milling profit, this district showing a profit of $0.54 a barrel, whereas the other four varied from $0.31 to $0.40. This large miscellaneous income in the mountain and coast district was due mainly to profits made by one company in the handling through its elevators of grains other than wheat. The inclusion of returns from outside investments and the deduction of interest paid from the milling profit gives the company profit, which showed considerable variation even aside from the mountain and coast district. It varied from $0.21 per barrel in the southeastern district to $0.32 in the southwestern and $0.44 in the mountain and coast district, with an average for all districts of $0.30.

The mountain and coast district had the lowest cost of sales in two years and the southwestern in only one year, yet for the four-year period the southwestern district had the lowest average cost of sales, $8.42, with the mountain and coast second, although after adding selling expense the latter district was lowest with $8.61, as its selling expense was $0.10 per barrel lower than that of any other district. The central and eastern district had the highest cost of sales in two years, and also the highest average for the period, $9.47 per barrel.

There was considerable variation in the selling expense, the northwestern district being the highest in each year and averaging $0.39 per barrel, while the mountain and coast district was the lowest in every year, averaging $0.13.

The central and eastern district, which has been shown as a high-cost district, received the highest price for its product in two years and for the period, being $10.13 per barrel for the period, while the mountain and coast district was lowest in three years and for the period, and received $1.29 less than the central and eastern district,

or $8.84 per barrel. This resulted in its obtaining the lowest average profit for the period, only $0.23 per barrel, as against a return of $0.31 for the northwestern and southeastern districts and up to the maximum of $0.36 per barrel for the central and eastern. The inclusion of the returns from the other activities of the company modified these figures to a certain extent in every district, but particularly in the mountain and coast district, where the average per barrel was $0.31, due to large earnings from handling of other grains than wheat.

This resulted in the mountain and coast district having the highest milling profit in two years and for the period, but in 1921 it was the lowest, showing a heavy loss. The lowest profit for the period was $0.31 per barrel in the southeastern district, although the northwestern's showing was only 1 cent higher. The average for the four-year period was $0.36 per barrel, which, as already shown, gave an average return of 10.6 per cent on the milling investment.

The inclusion of the return on outside investments and the deduction of interest paid to obtain the company profit per barrel reduced the return for the four-year period in amounts ranging from $0.05 to $0.13 per barrel, according to the district, but the mountain and coast district still showed the highest profit of $0.44 per barrel, and the southeastern was still lowest with $0.21 per barrel. The four-year average company profit per barrel was $0.30.

Chapter IV

COST OF WHEAT-FLOUR MILLING, 1919–1922

Section 1. Proportion of industry covered for costs.

Complete reports including costs, investment, and profits were secured from flour-milling concerns producing over 40 per cent of the total output of flour for the four-year period ending in 1922. All the cost reports obtained which were sufficiently complete were tabulated for the purposes of this report and the same companies were tabulated for milling investment and return thereon. The number of different companies tabulated for costs was 108, although the maximum number in any one year was 107, in 1921. The total estimated quantity of wheat flour produced in the United States and that produced by companies for which the cost of production is presented are shown in the following table:

Table 18.—*Number of barrels of flour produced in the United States compared with production of companies reporting cost of production to the commission, 1919-1922*

Year	United States [1]	Commission cost reports	Per cent reporting
	Barrels	*Barrels*	
1919	132,333,000	49,963,077	37.8
1920	108,783,000	51,184,852	47.1
1921	121,014,000	46,234,207	38.2
1922	125,310,000	50,148,305	40.0
Total	487,440,000	197,530,441	40.5

[1] Millers Almanack, 1923, p. 193.

The census shows a slightly larger total for the United States for 1919, its total for both merchant and custom mills being 133,670,672 barrels. The census does not report the total production for both merchant and custom mills for any other year of this four-year period.

The above table shows that the cost reports to the commission covered almost one-half of the wheat flour produced in this country in 1920, as compared with the low point of about 38 per cent in 1919. The average for the four-year period, 1919–1922, was a little over 40 per cent. These cost statements may be regarded as representative of the entire flour-milling industry.

Although the above mills produced over 40 per cent of the total wheat-flour production of the United States during the four-year period and 40 per cent in 1922, yet in the latter year they operated at

less than 60 per cent of their capacity as reported by the mills, as shown by the following table:

TABLE 19.—*Annual capacity of flour mills in the United States compared with annual production of companies reporting cost of production to the commission by districts for the year 1922*

District	Annual capacity	Production	Per cent
	Barrels	*Barrels*	
Northwestern	38, 955, 000	22, 556, 809	57. 9
Southwestern	24, 240, 000	13, 399, 818	55. 3
Southeastern	5, 235, 000	2, 150, 898	41. 1
Central and eastern	11, 977, 200	7, 646, 016	63. 8
Mountain and coast	8, 009, 700	4, 394, 764	54. 9
Total	88, 416, 900	50, 148, 305	56. 7

The annual capacity in the above table was computed on the basis of 300 operating days to the year, yet the production of the five districts in 1922 was only 56.7 per cent of the capacity of those same companies. There was comparatively little variation in the relation of production to capacity except in the case of the southeastern district, where the production was only 41.1 per cent of the capacity. In the other four districts the production ranged from 54.9 per cent of the rated capacity in the mountain and coast district to 63.8 per cent in the central and eastern district.

As already stated (see p. 43), information covering the company investment, earnings, and rate of return on investment was presented for a larger proportion of the industry. For example, the annual capacity of the above mills represented about 27 per cent of the wheat-flour milling capacity of the entire country, while the capacity of mills covered for the company investment and profits included about 37 per cent of that capacity.

Section 2. Quantity of wheat consumed per barrel of flour produced, by districts.

When only the quantity of wheat consumed or flour produced were given in the reports submitted by the company the commission in compiling its statements estimated that 4½ bushels of wheat were used to produce a barrel of flour, in accordance with the rough estimates made by the millers themselves. That this figure is approximately correct is shown by the fact that for the four-year period the average number of bushels used per barrel of flour for all districts combined was 4.56 bushels.

The following table shows the number of bushels of wheat used, barrels of flour produced, and bushels used per barrel of flour produced, by districts:

TABLE 20.—*Bushels of wheat used per barrel of flour produced, by districts, 1919-1922*

District	Bushels of wheat used	Barrels of flour produced	Bushels used per barrel
1919			
Northwestern	112, 165, 900	24, 903, 100	4. 50
Southwestern	50, 378, 711	11, 324, 023	4. 45
Southeastern	11, 584, 806	2, 604, 413	4. 45
Central and eastern	30, 700, 337	6, 962, 050	4. 41
Mountain and coast	18, 433, 826	4, 169, 491	4. 42
Total	223, 263, 580	49, 963, 077	4. 47
1920			
Northwestern	115, 242, 536	24, 335, 033	4. 74
Southwestern	57, 809, 745	12, 711, 371	4. 55
Southeastern	9, 507, 734	2, 001, 928	4. 54
Central and eastern	31, 684, 286	6, 908, 012	4. 59
Mountain and coast	22, 689, 839	5, 138, 508	4. 42
Total	236, 934, 140	51, 184, 852	4. 63
1921			
Northwestern	103, 191, 464	22, 169, 615	4. 65
Southwestern	52, 661, 292	11, 639, 090	4. 52
Southeastern	8, 688, 534	1, 920, 538	4. 52
Central and eastern	31, 002, 078	6, 975, 540	4. 44
Mountain and coast	15, 647, 323	3, 529, 424	4. 43
Total	211, 190, 691	46, 234, 207	4. 57
1922			
Northwestern	104, 216, 108	22, 556, 809	4. 62
Southwestern	60, 901, 351	13, 399, 818	4. 54
Southeastern	9, 888, 881	2, 150, 898	4. 60
Central and eastern	34, 650, 741	7, 646, 016	4. 53
Mountain and coast	19, 361, 451	4, 394, 764	4. 41
Total	229, 018, 532	50, 148, 305	4. 57
1919-1922			
Northwestern	434, 816, 008	93, 964, 557	4. 63
Southwestern	221, 751, 099	49, 074, 302	4. 52
Southeastern	39, 669, 955	8, 767, 777	4. 52
Central and eastern	128, 037, 442	28, 491, 618	4. 49
Mountain and coast	76, 132, 439	17, 232, 187	4. 42
Total	900, 406, 943	197, 530, 441	4. 56

The above table shows that the northwestern district used the greatest quantity of wheat per barrel of flour in all four years, varying from 4.5 bushels in 1919 to 4.74 in 1920, and averaging 4.63. The mountain and coast district used the smallest quantity of wheat for the four-year period, 4.42 bushels per barrel of flour. It was the lowest in all four years, except 1919, when it was 0.01 of a bushel above the central and eastern district, which used next to the smallest quantity of wheat for the period. The southwestern and southeastern districts averaged the same consumption for the period, with 4.52 bushels, and differed little in any year except 1922. Except in the case of the mountain and coast district, every district used the smallest number of bushels in 1919 and the greatest number in 1920. The quality of the 1920 spring wheat crop was inferior, which accounts for the larger number of bushels required to produce a barrel of flour in the northwestern district in that year.

Section 3. Method of computing costs.

The schedules sent out to the flour milling industry called for an analysis of costs, but not in any great detail. These costs, as reported, have been tabulated to show the following items: Wheat cost (including options, i. e., gains and losses on hedges in futures, and self-rising ingredients), labor, other milling expenses, depreciation, packages, feed credit (credit of value of feed by-products to cost of flour), and general expenses. A number of milling concerns do not hedge in the grain futures markets. In some cases it was necessary to estimate the proportion of package costs which should be assigned to flour milling and the proportion which should be deducted from the value of feed. In other cases it was necessary to estimate the value of the feed itself as the value of sales included the value of both flour and feed sold. Such estimates were all based upon the best figures obtainable, either the results of some mill in the immediate vicinity or an average figure for the mills in that district being applied.

Section 4. Total cost and cost per barrel, by districts.

As has already been shown, the cost statements tabulated by the commission cover over 40 per cent of the production of wheat flour in the United States during the four-year period under review. They show a total production for the period of nearly 200,000,000 barrels of flour at a total cost of almost a billion and three-quarters dollars, or an average of $8.85 per barrel.

The following table shows the total number of barrels of wheat flour produced, the total mill cost, and the cost per barrel, by districts:

TABLE 21.—*Barrels of flour produced, total mill cost, and cost per barrel, by districts, 1919–1922*

District	Flour produced	Total flour cost	
		Amount	Per barrel
1919			
	Barrels		
Northwestern	24,903,100	$251,033,068	$10.08
Southwestern	11,324,023	108,911,096	9.62
Southeastern	2,604,413	26,894,172	10.33
Central and eastern	6,962,050	71,268,777	10.24
Mountain and coast	4,169,491	39,614,808	9.50
Total	49,963,077	497,721,921	9.96
1920			
Northwestern	24,335,033	276,985,592	11.38
Southwestern	12,711,371	134,035,312	10.54
Southeastern	2,091,928	23,598,846	11.28
Central and eastern	6,908,012	76,535,414	11.08
Mountain and coast	5,138,508	50,813,768	9.89
Total	51,184,852	561,968,932	10.98
1921			
Northwestern	22,169,615	186,290,904	8.40
Southwestern	11,639,090	96,993,402	8.33
Southeastern	1,920,538	15,274,777	7.95
Central and eastern	6,975,540	60,902,754	8.73
Mountain and coast	3,529,424	30,291,975	8.58
Total	46,234,207	389,753,812	8.43

TABLE 21.—*Barrels of flour produced, total mill cost, and cost per barrel, by districts, 1919–1922*—Continued

District	Flour produced	Total flour cost	
		Amount	Per barrel
1922			
	Barrels		
Northwestern	22,556,809	$141,199,042	$6.26
Southwestern	13,399,818	72,837,362	5.44
Southeastern	2,150,898	13,342,773	6.20
Central and eastern	7,646,016	47,501,116	6.21
Mountain and coast	4,394,764	24,509,464	5.58
Total	50,148,305	299,389,757	5.97
1919–1922			
Northwestern	93,964,557	855,508,606	9.10
Southwestern	49,074,302	412,777,172	8.41
Southeastern	8,767,777	79,110,568	9.02
Central and eastern	28,491,618	256,208,061	8.99
Mountain and coast	17,232,187	145,230,015	8.43
Total	197,530,441	1,748,834,422	8.85

The above table shows that the southwestern district had the lowest average cost of production for the period, $8.41 per barrel, although it had the lowest cost in only one year out of the four. The mountain and coast district, on the other hand, which had the lowest cost in two years out of the four, had the second lowest cost for the period, $8.43, or 2 cents per barrel higher than the southwestern district. These two districts produced about one-third of the flour produced by all the companies covered for costs. The great northwestern district, which produced nearly one-half of the flour, had the highest average cost for the period, $9.10 per barrel, and was also highest in two out of the four years. The other two districts were almost as high for the period, as the cost in the southeastern district was only 8 cents lower, or $9.02 per barrel, while the cost in the central and eastern district was nearly as high at $8.99 per barrel.

Section 5. Principal elements of cost per barrel, by districts.

The most striking feature disclosed by a study of the different elements of cost making up the total mill cost is that the cost of producing flour for the four-year period was $0.16 per barrel less than the cost of the wheat ground. This was due to the fact that the cost of converting the wheat into flour, including depreciation and general expenses, was less than the value of the by-product—feed—obtained during the process of manufacture for two of the years and for the whole period. When wheat costs were high the mill cost of the flour was less than the cost of the wheat, but when wheat costs were on a lower level the mill cost of the flour was greater than the cost of the wheat.

Appendix Table 6 shows the quantities and amounts while the table following gives the per barrel cost of wheat, value of feed, and the principal elements of the cost of producing a barrel of flour, by districts, 1919–1922.

TABLE 22.—*Principal elements in the cost of producing wheat flour, by districts, 1919–1922*

District	Wheat	Labor	Other milling	Depreciation	Packages	General expense	Cost of flour and feed	Less feed credit	Net flour cost
1919									
Northwestern	$10.35	$0.21	$0.17	$0.02	$0.47	$0.16	$11.38	$1.30	$10.08
Southwestern	9.83	.21	.19	.04	.47	.24	10.98	1.36	9.62
Southeastern	10.76	.23	.16	.06	.55	.30	12.06	1.73	10.33
Central and eastern	10.51	.21	.13	.02	.53	.18	11.58	1.34	10.24
Mountain and coast	9.31	.31	.22	.05	.47	.20	10.56	1.06	9.50
Total	10.19	.22	.17	.03	.48	.19	11.28	1.32	9.96
1920									
Northwestern	12.24	.27	.20	.02	.50	.21	13.44	2.06	11.38
Southwestern	10.91	.26	.21	.04	.49	.28	12.19	1.65	10.54
Southeastern	11.72	.30	.21	.06	.74	.39	13.42	2.14	11.28
Central and eastern	11.60	.30	.15	.02	.55	.24	12.86	1.78	11.08
Mountain and coast	9.89	.38	.22	.05	.50	.20	11.24	1.35	9.89
Total	11.57	.28	.20	.03	.51	.24	12.83	1.85	10.98
1921									
Northwestern	8.41	.26	.21	.03	.33	.20	9.44	1.04	8.40
Southwestern	8.11	.26	.21	.05	.43	.33	9.39	1.06	8.33
Southeastern	7.82	.26	.18	.09	.43	.36	9.14	1.19	7.95
Central and eastern	8.67	.23	.14	.02	.35	.24	9.65	.92	8.73
Mountain and coast	8.20	.45	.22	.07	.45	.27	9.66	1.08	8.58
Total	8.33	.27	.20	.04	.37	.25	9.46	1.03	8.43
1922									
Northwestern	6.18	.22	.19	.02	.24	.20	7.05	.79	6.26
Southwestern	5.27	.21	.18	.05	.23	.27	6.21	.77	5.44
Southeastern	6.19	.23	.15	.09	.37	.32	7.35	1.15	6.20
Central and eastern	6.19	.17	.12	.02	.26	.20	6.96	.75	6.21
Mountain and coast	5.07	.33	.19	.06	.34	.19	6.18	.60	5.58
Total	5.84	.22	.17	.04	.26	.22	6.75	.78	5.97
1919–1922									
Northwestern	9.38	.24	.19	.02	.39	.19	10.41	1.31	9.10
Southwestern	8.46	.23	.20	.05	.40	.28	9.62	1.21	8.41
Southeastern	9.22	.25	.18	.07	.52	.34	10.58	1.56	9.02
Central and eastern	9.17	.22	.13	.02	.42	.21	10.17	1.18	8.99
Mountain and coast	8.17	.36	.21	.06	.45	.21	9.46	1.03	8.43
Total	9.01	.25	.19	.03	.40	.22	10.10	1.25	8.85

In the four years covered by the table the average cost of the wheat used per barrel of flour manufactured constituted from 87 to 90 per cent of the gross mill costs. From this it is obvious that any material change in wheat prices must have a great effect upon the cost of producing a barrel of flour, but the selling price of flour does not with any accuracy reflect these variations. It may be that the variation is shunted off in feed prices.

The above table shows that the average cost of the wheat used for the four-year period was $9.01 per barrel of flour produced, whereas the cost of the flour itself was only $8.85, or $0.16 per barrel less. That is, the cost of milling the wheat, which amounted to $1.09 per barrel of flour produced, was more than offset by the amount received for the feed produced, which amounted to $1.25 per barrel. The mountain and coast district had the lowest cost of wheat for the period, $8.17 per barrel of flour produced, and also for three out of the four

years, yet the mill cost of flour for this district was $8.43 per barrel, or $0.02 higher than for the southwestern district. The southwestern district had next to the lowest wheat cost but had lower operating costs and a larger feed credit than the mountain and coast district, which resulted in its having a lower flour cost. The northwestern district had the highest wheat cost for the period, $9.38, which was $0.16 higher than for the southeastern district, but its flour cost was only $0.08 higher, or $9.10 per barrel. The operating costs in the southeastern district were greater than similar costs in the northwestern district, but the feed credit more than sufficed to offset the larger operating costs.

Labor cost averaged $0.25 per barrel for the period and there was little variation between the districts, except in the case of the mountain and coast district, where it was $0.36, or $0.11 per barrel higher than in any other district. The labor cost in this district was at least 8 cents higher than any other district in every year, and in 1921 it was $0.19 higher. It ranged from $0.31 per barrel in 1919 to $0.45 in 1921, a difference of $0.14. The variation in the central and eastern district, however, was nearly as great, being $0.13, varying from $0.17 in 1922 to $0.30 in 1920, yet this district had the lowest average labor cost for the period, $0.22 per barrel. The least variation was in the southwestern district, which varied only $0.05 per barrel, being $0.21 in both 1919 and 1922 and $0.26 in the other two years.

The item of other milling expense showed considerable variation, the central and eastern district being the lowest in each year, ranging from $0.12 per barrel in 1922 to $0.15 in 1920 and averaging $0.13. The highest district in each year was the mountain and coast district, which fluctuated from $0.19 per barrel in 1922 to $0.22 in the other three years, with an average of $0.21 per barrel. The other districts averaged a little lower.

Depreciation was not adjusted by the commission but was accepted as charged by the companies. Naturally this resulted in considerable variation by districts, yet the average for all districts combined for the four-year period is 3 cents a barrel, which is what the United States Food Administration allowed the millers to charge during the war period. The northwestern and central and eastern districts each averaged 2 cents per barrel, which is practically what they charged in each year of the period. The southeastern district, however, had the high average charge for depreciation of $0.07 per barrel, charging $0.06 per barrel in 1919 and 1920 and $0.09 in the other two years. The mountain and coast and southwestern districts averaged $0.06 and $0.05 per barrel, respectively.

The largest element of manufacturing cost apart from the wheat itself is the cost of packages. The most striking feature is the high cost in the southeastern district, particularly in 1920, when it was $0.74 per barrel, or $0.19 higher than for any other district. For the entire four-year period it had the highest average, $0.52 per barrel, which was $0.07 higher than the mountain and coast average. The northwestern district had the lowest average cost of packages with a cost of $0.39 per barrel, which was 1 cent lower than for the southwestern and for all districts combined. By years

these districts were almost the same, except in 1921, when the southwestern was $0.10 higher.

General expense showed great variations, both the southeastern and southwestern districts being high. The southeastern district was highest in each year and averaged $0.34 per barrel, while the southwestern, which was next to the highest in each year, averaged $0.28 per barrel. The northwestern district had the lowest general expense in two years and the lowest for the period with $0.19 per barrel. The other two districts averaged $0.02 per barrel higher. The average for the period for all districts per barrel was $0.22.

The credit for feed fluctuates with the cost of wheat. It averaged $1.25 per barrel of flour produced for the four-year period, varying from $1.03 in the mountain and coast district to $1.56 in the southeastern district. In fact, the mountain and coast district had the smallest feed credit in all but one year, whereas the southeastern had the largest in each year. The highest wheat cost was in 1920, which resulted in the highest feed credits, varying from $1.35 in the mountain and coast district to $2.14 in the southeastern. The lowest wheat cost was in 1922, which resulted in the lowest feed credit, ranging from $0.60 in the mountain and coast district to $1.15 in the southeastern. The maximum variation in the average feed credit for the other three districts for the period was $0.13, ranging from $1.18 in the central and eastern to $1.31 in the northwestern district.

The average net mill cost for the period showed a variation of $0.69 per barrel, ranging from $8.41 in the southwestern district to $9.10 in the northwestern district. The cost of the mountain and coast district was only a trifle higher than the southwestern district in this respect, while the other two districts were nearly as high as the northwestern.

Section 6. Comparison of cost per barrel by companies.

During each year of the period 1919–1922 there was a wide range in the per-barrel cost of producing flour for individual companies. It has already been shown that the largest item in the cost of a barrel of flour is the cost of the wheat. The price of wheat varies widely in different sections of the country, chiefly due to the kind of wheat, its quality, and proximity to market. There was also considerable difference in elements of milling cost for individual companies. For the four-year period the milling costs ranged from a maximum of $13.99 per barrel in 1920 to a minimum of $4.87 per barrel in 1922.

Appendix Table 7 shows the cost by individual companies arranged from the lowest to the highest. To facilitate a study of costs the companies have been arranged in cost groups, each covering a range of $1 in cost, as is shown in the following table:

TABLE 23.—*Number of companies, average production per company, and proportion of wheat flour produced at specified cost groups, 1919–1922*

Cost group	Number of companies	Production: Total number barrels	Production: Per cent	Production: Average number barrels	Number of companies	Production: Total number barrels	Production: Per cent	Production: Average number barrels
	1919				1920			
$8.00–$8.99	1	119,685	0.2	119,685	1	159,861	0.3	159,861
$9.00–$9.99	53	21,678,048	43.4	409,020	16	8,585,786	16.8	536,612
$10.00–$10.99	41	27,257,143	54.6	664,808	32	20,443,515	39.9	638,860
$11.00–$11.99	6	908,201	1.8	151,367	41	15,467,177	30.2	377,248
$12.00–$12.99					14	6,166,367	12.1	440,455
$13.00–$13.99					1	362,146	.7	362,146
Total	101	49,963,077	100.0	494,684	105	51,184,852	100.0	487,475
	1921				1922			
$4.00–$4.99	1	133,795	0.3	133,795	4	2,797,157	5.6	699,289
$5.00–$5.99					52	26,702,563	53.3	513,511
$6.00–$6.99	19	3,915,240	8.4	206,065	37	18,455,511	36.8	498,798
$7.00–$7.99	23	4,769,285	10.3	207,360	7	2,118,855	4.2	302,694
$8.00–$8.99	29	29,423,326	63.7	1,014,597	1	74,219	.1	74,219
$9.00–$9.99	20	6,244,034	13.5	312,202				
$10.00–$10.99	10	982,758	2.1	98,276				
$11.00–$11.99	5	765,769	1.7	153,154				
Total	107	46,234,207	100.0	432,095	101	50,148,305	100.0	496,518

The above table shows that in 1920 the majority of companies had high costs; 56 companies producing 43 per cent of the wheat flour had a cost of $11 or more per barrel. In 1922 the majority of companies had low costs; 56 companies producing about 59 per cent of the total had costs of less than $6 per barrel. Only one company in one other year had a cost below $6 per barrel. In two years, however, there were other companies with costs in excess of $11 per barrel, six in 1919, and five in 1921.

In 1919 the cost averaged $9.96 per barrel and ranged from $8.67 to $11.42. Only one company had a cost below $9 while for six the costs were above $11. More than half of the companies with over 43 per cent of the production had costs ranging between $9 and $10 per barrel, while 41 companies producing nearly 55 per cent of the total had costs ranging from $10 to $11 per barrel.

In 1920, the year of highest costs and highest returns, the costs averaged $10.98 per barrel and ranged from $8.61 to $13.99. No single cost group as shown in the table contained a majority of the companies or of the production, but the greatest number was in the $11 to $12 group with over 30 per cent of the total output, while 32 companies with costs ranging from $10 to $11 per barrel produced nearly 40 per cent of the total.

In 1921 the costs averaged $8.43 per barrel and ranged from $4.90 per barrel for one company, which was the only company below $6, to $11.69, there being five companies above $11. Only about one-fourth of the companies appeared in any one group, 29 of them producing about 64 per cent of the total, having a cost of from $8 to $9 per barrel.

In 1922 the costs averaged $5.97 per barrel and ranged from $4.87, the lowest of the entire four-year period, to $8.12. There were, however, four companies with a cost below $5 per barrel. More than half of the companies producing 53 per cent of the total output had a cost between $5 and $6 per barrel.

In general the table also shows that for each year excepting 1922 the largest companies as a class had intermediate costs and that certain small companies had the lowest costs, while other small companies had the maximum costs. In 1922 one of the largest companies was in the low-cost group. In 1921 the range in cost for the large companies was from $8 to $9 per barrel, and 29 companies in that group with an average annual production of over 1,000,000 barrels, produced nearly 64 per cent of the total output of the 107 companies.

Section 7. Graphic presentation of individual costs.

Chart 2 (opposite) shows in graphic form the principal elements of the cost of producing a barrel of flour by companies, while the data upon which the chart is based are given in Appendix Table 8, page 113. The year 1922 was selected partly because it was the most recent one and partly because it appears to have been an average year. In 1922 the average rate of return for the milling business for all companies covered was 10.9 per cent, while the average for the four-year period, including both profitable and unprofitable years, was 10.6 per cent.

The principal elements of the mill cost of producing a barrel of wheat flour, in the order of their importance are (1) wheat, (2) packages, (3) labor, and (4) general expense. The amount of depreciation charged in flour milling costs is very small, and all other milling costs constitute only a small proportion of the total. Chart 2 shows separately the wheat, package, and labor costs, while the general expense, depreciation, repairs, and other expenses are included in "Other costs."

The mill cost of producing a barrel of wheat flour for each company is shown by the height of the column above the zero line, while the portion below the zero line represents the amount of receipts from by-products (i. e., bran, shorts, middlings, etc.), which was credited to the total cost of producing flour and feed. The total length of the black portion of the column both above and below the zero line represents the total or gross cost of the wheat used by each company in producing a barrel of flour and the by-products made in connection therewith.

The relative importance of each company's production in 1920 is indicated by the width of each column. Three groups are designated, the widest column being used for the largest production group; these groups are (1) companies producing 1,000,000 barrels or over, (2) companies producing from 300,000 to 1,000,000 barrels, and (3) companies producing under 300,000 barrels in 1922.

The chart shows that the bulk of the cost of a barrel of flour is the cost of the wheat, while for most companies the next most important item is the cost of packages. The item of packages differed greatly for individual companies, depending upon differences in method of sales. One company, for example, which sold most of its flour in bulk had a very low package cost. The chart also shows that the labor and other costs, including general expense and depreciation, varied greatly for individual companies.

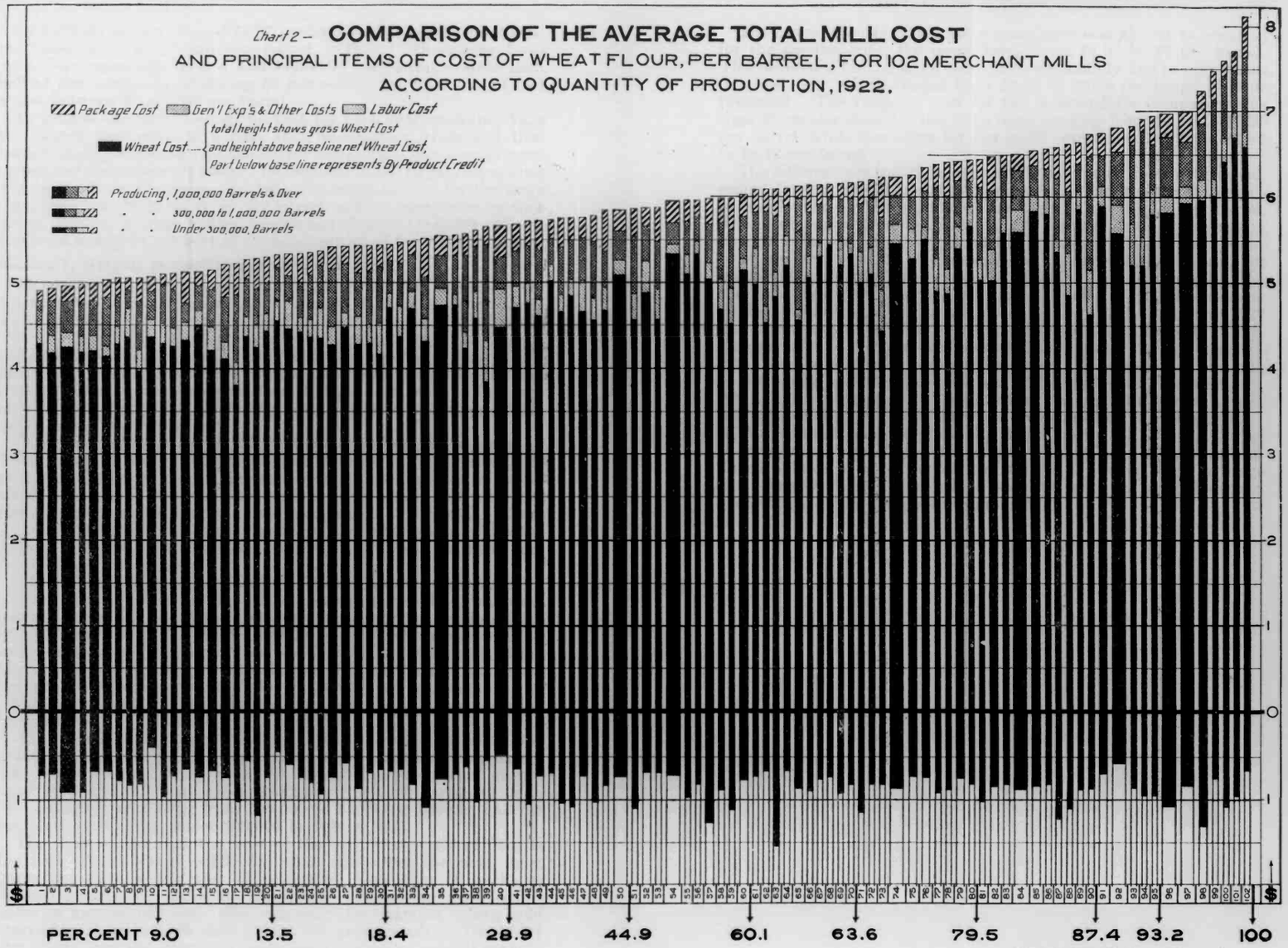


Chart 2 – COMPARISON OF THE AVERAGE TOTAL MILL COST
AND PRINCIPAL ITEMS OF COST OF WHEAT FLOUR, PER BARREL, FOR 102 MERCHANT MILLS
ACCORDING TO QUANTITY OF PRODUCTION, 1922.
Package Cost
Gen'l Exp's & Other Costs
Labor Cost
Wheat Cost
total height shows gross Wheat Cost
and height above base line net Wheat Cost,
Part below base line represents By Product Credit
Producing, 1,000,000 Barrels & Over
300,000 to 1,000,000 Barrels
Under 300,000 Barrels
$
PER CENT 9.0
13.5
18.4
28.9
44.9
60.1
63.6
79.5
87.4
93.2
100

The range in costs of the large companies was almost as great as for the smaller ones, the range being from $4.97 to $7 per barrel. This difference for the large companies was mainly due to differences in wheat cost, which ranged from $4.23 to $5.95 per barrel of flour produced. The range in cost for the intermediate companies was slightly greater than for the large ones, ranging from $4.94 to $7.25 per barrel, while the range for the small companies was from $4.87 to $8.12 per barrel.

The difference in cost from company to company was very gradual, except for the five highest cost companies. The greatest difference in cost for the first 50 companies was slightly less than $1 per barrel. These companies produced about 45 per cent of the total production covered at a cost of $5.84 per barrel, or less. Sixty per cent of the total was produced by 60 companies at a cost of $6.03, or less, per barrel; the cost of 87 per cent was $6.74, or less, per barrel. The simple average cost was $5.97 per barrel which was exactly the same as the weighted or actual average cost for the 102 companies in 1922 and three companies (Nos. 57, 58, and 59) had this same cost. Fifty-nine per cent of the total was produced at or under the average cost. The mean between the high and low cost, i. e., one-half of the sum of the lowest and highest costs, was $6.52 per barrel; one company, No. 84, had this same cost. Eighty-four per cent of the total output was produced at or below the mean average of $6.52 per barrel.

There was an increase of exactly $1 per barrel ($5.44 to $6.44) for 51 companies beginning with company 30. These companies produced a little over 61 per cent of the total output, their average cost being $5.93 per barrel, which is only 4 cents per barrel less than the average for all companies combined.

Chapter V

INVESTMENT, COSTS, AND PROFITS 1913–1922

Section 1. Companies covered for the 10-year period.

In the report on commercial wheat flour milling issued by the Federal Trade Commission in 1920 the results for 37 companies (41 companies, treating subsidiaries as separate companies) were shown for the five-year period, ending in 1918. Most of these same companies were also covered in the present inquiry for the four-year period, 1919–1922. From some of them, however, complete information was not received, so for a comparison of the results for the period it was possible to use only 28 companies instead of 41, as in the previous report. Consequently it was not possible to use any of the tabulations shown in the previous report, but it was necessary to work up an entirely new set of tables. In addition to the above period, however, it was found possible to use the figures on file with the commission for the same companies for their business year ending in 1913, which had not been used previously, thus giving comparative results for 28 identical companies over a 10-year period. The same geographical grouping is used as in the previous report.

Section 2. Proportion of milling capacity covered.

Although these 28 identical companies operated only 78 mills out of about 4,800 commercial wheat flour mills in the United States, yet they represent almost one-sixth (16.2 per cent) of the total capacity of the country in 1922, and produced over one-fourth of the flour produced in that year.

The following table shows the total production of flour in the United States, compared with the production of the 28 identical companies for the nine-year period, 1914–1922:

Table 24.—*Number of barrels of flour produced in the United States compared with the production of the 28 identical companies, 1914–1922* [1]

[In thousands of barrels]

Year	United States [2]	Identical companies	Per cent
	Barrels	*Barrels*	
1914	116,023	33,895	29.2
1915	114,633	33,259	29.0
1916	119,947	39,205	32.7
1917	117,785	33,504	28.4
1918	110,610	30,250	27.3
1919	132,333	34,464	26.0
1920	108,783	34,741	31.9
1921	121,014	32,057	26.5
1922	125,310	34,322	27.4
Total	1,066,438	305,697	28.7

[1] 1913 is omitted as the United States production is not available.
[2] Miller's Almanack, 1923, p. 193.

The above table shows very close uniformity in the proportion of the total flour production of the country produced by the 28 companies. It averaged 28.7 per cent for the nine-year period, and ranged from 26 per cent in 1919 to 32.7 per cent in 1916, which was the year of maximum production for the 28 companies during the period. Their production was approximately 4,500,000 barrels greater in that year than in any other year, although the production for the country was less than in three other years.

Section 3. Method of computing investment, profits, and costs.

Investment.—The investment for the 10-year period, 1913–1922, is shown on two different bases, and, with the exception of 1913, the mean of the investment at the beginning and at the end of each year has been taken as the investment for the year. The investment at the beginning of 1913, however, was not available so the investment at the end of the year was used as the investment for that year. Inventory valuations and depreciation charged have been accepted as shown by the company and not revised as was done in the previous report. The two different kinds of investment shown are as follows:

1. *Milling investment*, which is the investment in the milling business of the company (it being impossible to separate the flour milling investment from total milling investment) was computed from the liabilities side of the balance sheet and included the capital stock, bonds, surplus, and contingent reserves. Appreciation and good will were deducted.[1] Reserves for depreciation and bad debts were treated as deductions from plant account and accounts receivable respectively. In the reports received for the period 1913–1918 no analysis of the interest account or of notes payable was made, consequently it was impossible to arrive at the total amount of borrowed money used in the business. The amount of bonds and bond interest paid thereon was obtained, however. Although the amount of borrowed money was obtained for the period covered by the present report in order to make a comparative study for the 10-year period, it was necessary to put the figures for the 28 companies for the 4-year period on the basis of the figures available for the previous 6-year period by including in the investment only that part of the borrowed money represented by bonds. From the investment figure thus obtained, outside investments were deducted to obtain the milling investment of the company.

2. *Company investment*, which is the investment that the stockholders, collectively as a company, have in the business, was obtained by deducting the bonds from the milling investment, but adding back thereto the outside investments.

Income.—The operating profit of the company from its flour-milling business was obtained by deducting the cost of sales (including selling expenses) from the value of the flour sold. The profit on feed was treated as a credit to costs and hence is taken up in the cost of sales. The profit on coarse grains and from the other activities of the company, also the net interest (except interest on bonds and outside investments) and bad debts, are added to the operating profit of the company to obtain the profit from its total milling

[1] See footnote, Chapter III, p. 29

business. As there have been two kinds of investment shown, two kinds of profits to correspond thereto have been computed, as follows:

1. *Milling profit*, which is the profit received by the company from all sources except outside investments, is used for computing return on milling investment. To obtain the milling profit all the miscellaneous gains and losses (before deducting interest on bonds) were added to, or subtracted from, the total operating profit of the company, according to whether they showed a gain or a loss. The income from outside investments was then deducted to obtain the milling profit.

2. *Company profit*, which is the profit that accrues to the stockholders, collectively as a company, before the payment of income or profits taxes, was obtained by deducting the interest on bonds from the milling profit and adding back thereto the income from outside investments.

Costs.—The costs for the 28 identical companies for the 10-year period were tabulated in the same form as for the companies used in the present report, except that the item of packages covers the cost of packages for both feed and flour instead of for flour alone, and consequently the credit for feed is larger by the amount of feed packages included in the package item. The cost items shown are wheat cost (including options, i. e., gains or losses on hedges in futures, and self-rising ingredients), labor, other milling expenses, depreciation, packages (both flour and feed), feed credit (credit of value of feed by-products to cost of flour), and general expenses.

Section 4. Milling investment, net income, and rate of return.

The method of arriving at the milling investment and net income has already been described (see p. 59). The investment for the 28 identical companies combined shows an increase in every year over the preceding year, nearly doubling in the 10-year period. The return on this investment averaged 18.5 per cent for this period. The wheat-flour mills owned by these 28 companies are located in three districts which are differently defined from the five districts shown in the preceding chapter. The three districts are (1) northwestern, including mills in Minnesota, North Dakota, and Montana; (2) southwestern, with mills in Kansas, Missouri, and Nebraska; and (3) the eastern, with mills in Tennessee, Kentucky, Ohio, and New York. The first two districts are similarly defined, although they do not cover as large a number of States as in the preceding chapter, while companies grouped in the southeastern and central and eastern districts in the preceding chapter are here grouped together in the eastern district, but operate in a smaller number of States.

The following table shows the average milling investment, net income, and rate of return for 28 identical companies engaged in the flour-milling business, by districts:

Table 25.—*Milling investment—Net income and rate of return on investment for 28 identical companies by districts, 1913–1922*

Year and district	Investment	Net income	Rate of return
			Per cent
1913—Northwestern	$24,861,446	$3,956,276	15.9
Southwestern	5,125,591	185,732	3.6
Eastern	7,828,121	503,613	6.4
Total	37,815,158	4,645,621	12.3
1914—Northwestern	25,551,470	4,927,949	19.3
Southwestern	5,347,788	881,850	16.5
Eastern	7,883,008	734,910	9.3
Total	38,782,266	6,544,709	16.9
1915—Northwestern	27,465,420	5,288,132	19.3
Southwestern	6,140,073	1,461,907	23.8
Eastern	8,181,459	976,767	11.9
Total	41,787,452	7,726,806	18.5
1916—Northwestern	30,491,987	7,063,805	23.2
Southwestern	6,995,003	1,008,692	14.4
Eastern	8,481,309	840,020	9.9
Total	45,968,299	8,912,517	19.4
1917—Northwestern	36,436,276	14,248,163	39.1
Southwestern	8,887,520	3,996,794	45.0
Eastern	9,114,874	1,639,278	18.0
Total	54,438,670	19,884,235	36.5
1918—Northwestern	41,503,762	11,124,861	26.8
Southwestern	11,198,845	3,747,435	33.5
Eastern	10,060,302	2,167,630	21.5
Total	62,762,909	17,039,926	27.1
1919—Northwestern	40,957,712	7,451,402	18.2
Southwestern	12,349,477	2,888,857	23.4
Eastern	11,274,046	1,635,856	14.5
Total	64,581,235	11,976,115	18.5
1920—Northwestern	44,268,084	10,296,172	23.3
Southwestern	14,772,979	4,064,629	27.5
Eastern	11,661,829	707,094	6.1
Total	70,702,892	15,067,895	21.3
1921—Northwestern	45,075,393	1,923,663	4.3
Southwestern	15,453,499	[1] 393,657	[1] 2.5
Eastern	11,840,166	349,765	3.0
Total	72,369,058	1,879,771	2.6
1922—Northwestern	44,773,375	7,032,187	15.7
Southwestern	15,765,685	1,620,681	10.3
Eastern	11,983,956	1,331,522	11.1
Total	72,523,016	9,984,390	13.8
1913–1922—Northwestern	361,384,925	73,312,611	20.3
Southwestern	102,036,959	19,462,919	19.1
Eastern	98,309,069	10,886,453	11.1
Total	561,730,953	103,661,983	18.5

[1] Loss.

The above table shows that the investment for all companies combined increased in every year, advancing from $37,800,000 in 1913 to $72,500,000 in 1922, or nearly 100 per cent. Both the southwestern and eastern districts increased their investment in every year, but the northwestern district showed a decrease in two years. For

the whole period, however, the northwestern district increased its investment from nearly $24,900,000 in 1913 to nearly $44,800,000 in 1922, or 80 per cent. During the same period the investment in the southwestern district more than tripled and in the eastern district increased more than 50 per cent.

The net income varied with business conditions. It ranged from about $1,880,000 in the lean year of 1921 to about $19,880,000 in the prosperous year of 1917, when the United States entered the World War. For the whole period over 70 per cent of the net income was earned by the companies in the northwestern district. Only one district showed a loss during the whole period, namely, the southwestern in 1921.

The average return on investment for all groups combined for the 10-year period was 18.5 per cent, ranging from 2.6 per cent in 1921 to 36.5 per cent in 1917. Both the northwestern and southwestern districts showed a higher average rate of return, with 20.3 and 19.1 per cent, respectively, but the eastern district with average earnings of only 11.1 per cent materially reduced the percentage for the entire group. For individual years the northwestern district showed the highest average rate of profit in five years and next to the highest rates in the other five years, the rates ranging from 4.3 per cent in the lean year of 1921 to 39.1 in the prosperous year of 1917.

The southwestern district, however, showed the greatest variation in average profits of any of the three districts, ranging from a loss of 2.5 per cent in 1921 to a profit of 45 per cent in 1917. This district showed the highest rates of profit in 5 years and the lowest in 3 years out of the 10-year period. The eastern district showed the lowest rate of profit in 7 years out of the 10. It made its poorest showing, with 3 per cent, in 1921, the low year for the other two districts. Its best year, instead of being in 1917, as was the case with the other two districts, came in 1918, with an average of 21.5 per cent, which was much lower than the other districts showed in several years.

Section 5. Return on investment by companies.

A study of the returns for the individual companies for the 10-year period reveals much greater variations. The annual rate of return for one company ranged from a loss of 62.4 per cent to a profit of 39.4 per cent.

The following table shows the rate of return on investment for the 28 identical companies, by companies:

TABLE 26.—*Rate of return on milling investment for 28 identical companies, 1913–1922*

District	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	Average
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Northwestern:											
1	3.5	14.4	27.8	18.2	48.5	54.5	0.5	[1] 47.0	[1] 14.2	1.5	9.2
2	8.7	8.8	9.4	8.2	15.6	28.1	11.8	32.2	[1] 13.1	11.2	12.8
3	27.8	21.3	[1] 12.9	12.5	39.4	31.9	11.5	[1] 2.8	[1] 62.4	[1] 25.9	4.9
4	7.8	15.3	40.3	24.4	38.7	51.5	41.4	41.1	[1] 13.3	2.3	28.0
5	11.6	11.8	4.9	20.6	29.6	14.8	29.1	25.9	18.0	13.6	18.8
6	17.6	24.7	30.8	25.9	58.6	26.1	15.1	27.5	2.3	23.5	24.5
7	16.9	19.8	13.4	19.4	22.1	32.4	19.0	11.6	3.3	11.5	16.3
8	19.3	19.8	18.6	30.4	28.4	28.0	21.5	26.5	13.4	15.8	22.3
9	18.3	21.0	12.8	31.5	38.2	24.9	27.6	41.3	1.2	8.1	21.7
10	7.3	8.7	8.7	14.8	30.6	17.4	9.6	12.3	[1] 1.9	[1] .1	10.6
Average	15.9	19.3	19.3	23.2	39.1	26.8	18.2	23.3	4.3	15.7	20.3
Southwestern:											
1	22.2	20.7	18.5	11.3	60.2	31.4	26.3	44.0	[1] 3.5	17.3	24.5
2	7.3	.1	14.1	20.8	31.5	40.3	19.5	18.6	12.7	10.3	18.1
3	.1	11.8	18.1	13.2	57.7	36.2	16.8	31.0	[1] 24.5	10.4	16.5
4	16.0	34.0	19.1	30.5	94.3	15.5	35.5	12.3	24.3	24.4	30.9
5	13.3	28.8	34.8	23.3	17.4	37.1	18.4	[1] 4.7	[1] 6.8	[1] 3.1	17.7
6	13.0	15.9	16.1	11.8	39.6	18.4	7.2	14.1	[1] 13.1	[1] 2.2	12.4
7	16.5	17.3	17.7	18.4	50.9	30.5	18.2	38.4	9.8	10.2	21.6
8	[1] 2.5	26.8	22.7	.0	22.8	13.0	46.6	31.1	14.1	8.2	18.6
9	23.4	32.2	32.4	16.5	33.5	38.0	31.1	38.2	6.2	8.5	22.2
10	5.0	32.4	25.3	10.5	34.0	16.6	56.4	50.8	7.8	47.5	27.7
11	[1] 27.5	5.3	69.4	16.5	33.5	55.3	28.7	6.3	1.8	[1] .8	19.9
12	[1] 12.2	2.4	34.3	[1] 4.8	33.8	12.3	12.9	.4	.2	[1] .8	7.2
Average	3.6	16.5	23.8	14.4	45.0	33.5	23.4	27.5	[1] 2.5	10.3	19.1
Eastern:											
1	4.4	14.1	17.9	16.3	26.7	23.4	12.2	[1] 12.0	[1] 34.3	[1] 4.3	5.9
2	11.4	15.2	19.8	3.4	52.9	34.8	28.7	[1] 16.6	22.3	57.3	25.2
3	3.8	1.6	10.7	9.4	22.2	38.4	6.5	47.4	[1] 10.3	8.9	14.5
4	8.9	24.4	29.2	18.5	43.4	47.7	37.3	50.0	[1] 14.3	3.8	26.1
5	19.3	19.3	12.6	4.9	12.7	12.8	24.6	[1] 10.1	.5	[1] 10.3	8.0
6	5.5	7.6	9.1	9.9	8.3	14.3	11.4	4.8	5.7	5.7	8.1
Average	6.4	9.3	11.9	9.9	18.0	21.5	14.5	6.1	3.0	11.1	11.1
Average	12.3	16.9	18.5	19.4	36.5	27.1	18.5	21.3	2.6	13.8	18.5

[1] Loss.

Of the 10 companies in the northwestern district which averaged 20.3 per cent for the period, only 2 showed an average profit for the 10-year period of less than 10 per cent, namely, 9.2 and 4.9, respectively, while 4 showed an average profit of more than 20 per cent. Of the 12 companies in the southwestern district, which averaged 19.1 per cent for the 10-year period, only 1 showed an average profit of less than 10 per cent, namely, 7.2 per cent, while another showed an average profit of nearly 31 per cent. The eastern district of six companies made much the poorest showing with a 10-year average profit of 11.1 per cent, and three of the companies showed average profits of less than 10 per cent, while two of them showed average profits in excess of 20 per cent.

The greatest variations were shown in the case of the two companies showing the lowest profit in the northwestern district. Company No. 3, with an average return of 4.9 per cent for the 10-year period showed a range from a loss of 62.4 per cent in 1921 to a profit of 39.4 per cent in 1917. Company No. 1 with a 10-year average return of less than 10 per cent showed next to the highest profit for a single year, namely, 54.5 per cent in 1918, and also showed next to the greatest loss during the period, namely, 47 per cent in 1920. The greatest range for any other company was for company No. 4 in the

southwestern district which, with the maximum average profit for the period of 30.9 per cent, had a range from 94.3 per cent in 1917, the highest profit for a single year, to 12.3 per cent in 1920.

In the lean year of 1921, with an average return of 2.6 per cent, 12 companies out of the 28 showed losses, only 2 companies showed returns of over 20 per cent, and only 6 over 10 per cent. In the year 1917, on the other hand, only 1 company earned less than 10 per cent, only 4 less than 20 per cent, and 6 earned in excess of 50 per cent.

Section 6. Return on company investment.

The milling investment and the return thereon have already been discussed. As the company investment represents the money put into the business by the stockholders collectively, as a company, and does not include borrowed money, it is smaller than the milling investment in every year, except when the outside investments are greater than the bonded debt. As already stated bonds were the only form of borrowed money that could be shown separately for the 28 identical companies. In every year the return on the company investment for the group as a whole was larger than the return on the milling investment. For the first six years of the period this difference was quite marked, but for the last four years it was small.

The data for the company investment are shown in more detail in Appendix Table 9. The following table shows the return on the company investment for the 28 identical companies by districts:

TABLE 27.—*Rate of return on company investment for 28 identical companies, by districts, 1913–1922*

Year	District			28 companies	Year	District			28 companies
	North-western	South-western	Eastern			North-western	South-western	Eastern	
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*		*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
1913	19.1	3.5	7.6	15.1	1919	19.1	20.7	15.5	19.0
1914	21.9	16.9	10.1	19.4	1920	23.6	25.8	5.3	21.5
1915	22.1	25.0	14.0	21.4	1921	5.3	[1] 1.8	2.0	3.2
1916	25.2	15.1	11.6	21.6	1922	17.2	9.8	11.8	14.7
1917	42.2	47.5	21.2	40.2					
1918	28.1	34.3	24.5	28.8	Average	21.9	18.7	12.2	19.9

[1] Loss.

The above table shows an average return on the company investment for the 10-year period of 19.9 per cent, as against a return of 18.5 per cent on the milling investment. (See section 4.) The return on investment by districts shows the same relation from low to high as the return on milling investment. In each year the return on company investment in the northwestern district was greater than the return on milling investment. The same did not hold true for the other two districts, however. In fact, the average return for the southwestern district was slightly lower on company investment than it was on milling investment. This was due to the outside investments included in the company investment being greater than the amount of bonded indebtedness.

The average return on company investment for all districts varied from 3.2 per cent in 1921 to 40.2 per cent in 1917. It averaged 21.9 per cent for the northwestern district, ranging from 5.3 per cent in 1921 to 42.2 per cent in 1917. In fact, 1921 was low for all three

districts, with the southwestern showing a loss of 1.8 per cent and the eastern showing the very low average profit of 2 per cent. The eastern district, however, made its best showing in 1918, with 24.5 per cent, whereas the other two districts had their best year in 1917, the southwestern district showing an average profit of 47.5 per cent.

Section 7. Profit per barrel of flour.

The milling profit for the 28 identical companies for the 10-year period averaged $0.30 per barrel and the company profit was $0.31 per barrel. In this connection it must be borne in mind that the milling profit in this table has already had all interest deducted except interest on bonded indebtedness, whereas in the case of the companies discussed for the 4-year period no interest was deducted from the milling profit, but it was among the items deducted therefrom to obtain the company profit. Appendix Table 10 gives data covering the quantity and amounts of sales and profits, while Appendix Table 11 shows the per barrel cost of sales, selling expense, value of sales, and profit by districts.

The cost of sales may differ somewhat from the cost of production due to inventory differences and to the inclusion of the cost of any purchased flour which is resold.

Appendix Table 11 shows that the operating profit per barrel was practically the same for all districts for the 10-year period, averaging $0.33 for the group and for the northwestern district, while the other two districts were 1 cent higher. By years, the operating profit showed wide variations, however, ranging from $0.17 in 1913 to $0.57 per barrel in 1917, and the northwestern district ranged from $0.18 to $0.60 per barrel in the same years. Although the southwestern district had its lowest operating profit in the same year of 1913, its highest profit, $0.60 per barrel, came in 1920. The eastern district had its poorest year in 1921 with a profit of $0.17 per barrel, while its best year was in 1919 with a profit of $0.57.

The milling profit per barrel averaged 3 cents less than the operating profit, because the other activities of the companies showed a loss for the period. The loss for the northwestern district also averaged 3 cents per barrel, while for the southwestern district it was only 1 cent. It was greatest for the eastern district at 4 cents per barrel. In six years out of the ten all districts showed a loss from other activities, and in only one year, 1918, did they all show a profit.

The company profit per barrel averaged 1 cent more than the milling profit. The increase was the same for both the northwestern and southwestern districts. The decrease of 5 cents in the eastern district was not reflected in the average. The difference between the milling profit and the company profit was practically the same in every year as the difference shown for the 10-year average. The average for the group was $0.31 per barrel, the same as for the northwestern district, while the southwestern district showed a profit of $0.34 and the eastern district a profit of only $0.25.

Section 8. Total cost of flour per barrel.

The cost of flour per barrel showed wide fluctuations during the 10-year period and was much lower during the pre-war period, 1913–1916, than it has been since. The average for all districts combined is not widely different from the average for the northwestern district in any year, the maximum variation being $0.19 per barrel in the highest cost year of 1920.

The following table shows the cost of producing flour per barrel for the 28 identical companies, by companies and by districts:

TABLE 28.—*Annual average cost of producing wheat flour, per barrel, by companies and districts, 1913–1922*

District and company	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	Average
Northwestern:											
1	$3.68	$4.35	$5.20	$6.51	$9.62	$9.72	$10.17	$11.32	$6.66	$5.78	$6.94
2	3.58	3.90	5.05	5.78	8.43	9.39	9.96	11.36	9.17	6.56	7.09
3	3.82	3.70	5.63	4.42	8.29	9.91	9.97	11.52	9.02	6.44	6.94
4	3.94	3.68	4.78	4.61	7.08	9.34	9.83	10.69	9.28	6.18	6.78
5	3.88	3.76	5.52	4.83	8.51	9.71	9.93	12.07	8.73	6.82	7.50
6	3.78	3.51	5.31	4.59	7.98	9.43	10.08	10.91	8.31	5.90	6.91
7	3.66	3.60	5.25	4.56	8.00	9.12	10.11	11.51	8.47	6.24	6.95
8	3.80	3.79	5.42	4.75	8.37	9.36	10.15	11.47	8.57	6.52	6.75
9	3.75	3.69	5.95	4.82	8.07	9.69	10.13	11.68	9.45	6.98	7.33
10	3.71	3.52	5.39	4.23	7.67	9.56	9.98	10.78	8.34	5.87	6.65
Average	3.75	3.62	5.32	4.66	8.06	9.38	10.06	11.28	8.53	6.21	6.97
Southwestern:											
1	3.61	3.44	4.84	4.39	6.33	9.40	9.28	10.32	8.51	5.14	6.44
2	3.70	3.69	5.16	4.49	7.89	9.33	9.55	10.58	7.76	5.54	7.15
3	3.72	3.49	4.33	4.46	6.53	9.84	9.16	9.86	8.73	4.97	6.84
4	3.52	3.64	5.62	5.73	8.40	9.86	9.49	10.72	6.08	5.15	6.82
5	3.46	3.57	4.84	5.45	9.62	9.63	9.65	11.31	6.03	5.06	6.39
6	4.16	4.16	5.00	4.85	8.03	10.04	9.33	10.31	8.75	5.11	6.80
7	3.47	3.40	4.42	4.63	8.46	9.33	9.73	10.11	8.61	4.94	7.43
8	4.91	3.85	4.91	5.22	6.92	9.93	9.63	10.89	6.96	5.43	6.88
9	3.57	3.57	4.46	4.50	6.79	9.31	9.35	10.39	8.95	5.41	6.70
10	4.47	3.71	4.47	5.07	7.07	9.61	9.62	9.89	9.76	5.76	7.02
11	4.02	3.78	4.53	4.76	7.22	9.72	9.75	11.17	6.51	5.48	6.75
12	4.41	3.96	4.59	4.94	7.07	9.83	9.72	11.69	6.44	5.61	6.79
Average	3.87	3.63	4.66	4.67	7.16	9.63	9.41	10.31	8.10	5.25	6.86
Eastern:											
1	4.89	4.35	5.15	5.51	7.77	10.02	10.47	11.55	7.08	5.97	7.08
2	4.58	4.21	5.14	5.08	6.91	9.60	9.88	10.73	6.83	5.52	6.82
3	4.04	3.56	4.42	4.78	5.93	9.38	9.87	9.19	9.35	6.10	6.67
4	4.53	3.84	4.76	5.09	6.95	9.74	9.99	9.94	10.45	6.21	6.64
5	4.15	4.54	5.87	6.43	10.23	10.24	10.75	12.27	8.02	7.71	7.56
6	4.44	4.18	5.81	5.36	9.08	10.25	10.55	12.18	9.13	7.00	7.85
Average	4.48	4.11	5.34	5.30	7.93	9.96	10.30	11.23	8.39	6.42	7.29
All districts	3.84	3.68	5.22	4.73	7.90	9.49	9.97	11.09	8.43	6.03	6.99

The cost of production showed the cost of the flour actually produced within a given year while the cost of sales, shown in the preceding table, shows the cost of the flour sold. These two costs may differ somewhat, due to inventory differences, and the inclusion in cost of sales, of the cost of any purchased flour which is resold.

The above table shows an average cost of producing flour for the 10-year period of $6.99 per barrel, which was 2 cents higher than for the northwestern district and 13 cents higher than for the southwestern district, but 30 cents lower than for the eastern district. The southwestern district showed the lowest cost for the period and also for 6 of the 10 years. In fact it had the lowest cost in each of the last 4 years. The northwestern district had the second lowest cost for the period, but was lowest in 4 of the 10 years. During the last 4 years it was next to low twice and the highest twice. The eastern district which generally had higher wheat, package, labor and overhead costs had the highest cost for the 10-year period and was highest in 7 of the 10 years, one of the other two districts being lowest in each year.

The lowest cost year for the period in all three districts was in 1914, when the average cost was $3.68 per barrel, which was $0.06 higher than for the northwestern district, $0.05 higher than for the southwestern, but $0.46 lower than for the eastern district. The highest cost year was 1920 in all three districts when the average cost

was $11.09 per barrel, or three times the cost in 1914. The cost in the northwestern district was $0.19 higher in 1920 than for all districts combined, while the eastern district had a cost that was only $0.14 higher than the average for all districts. The southwestern district had a lower cost than any other district, its cost of $10.31 per barrel being $0.78 below the average for all districts.

The lowest cost for any company for the entire period, 1913–1922, was in the southwestern district in 1914, when one company had a cost of $3.44 per barrel. The highest cost for the period for an individual company was $12.27 per barrel in the eastern district in 1920, although one other company in the same district had a cost only $0.09 lower. These two companies also had the highest average costs for the 10-year period, although in reverse order.

The lowest average cost for the period was $6.39 per barrel for a company in the southwestern district, which also had the lowest cost in 2 of the 10 years.

Section 9. Elements of flour cost.

Throughout the entire 10-year period the cost of the wheat ground constituted from 87 to 92 per cent of the gross mill cost, which includes the cost of the flour manufactured and packed and the feed obtained therefrom, while the cost of the packages was the second largest single item. The labor cost ranged from a minimum of $0.10 per barrel to a maximum of $0.27 per barrel and constituted from less than 2 to only 3 per cent of the total cost of the packed flour and feed.

Appendix Table 12 gives the quantities produced and the amount for each item of cost by districts, while the following table shows the per barrel cost by principal items of expense for all districts combined:

TABLE 29.—*Annual average mill costs per barrel of wheat flour, for 28 identical companies, with index numbers, 1913–1922, and average for 10-year period*

Item	Cost per barrel										
	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	Average 10 years
Wheat	$3.95	$3.87	$5.52	$4.96	$8.46	$9.77	$10.23	$11.85	$8.42	$5.99	$7.25
Labor	.10	.11	.11	.10	.13	.17	.21	.27	.25	.20	.17
Other mill costs	.08	.08	.08	.08	.11	.16	.16	.18	.19	.17	.13
General expense	.08	.09	.10	.09	.13	.17	.17	.22	.22	.20	.14
Depreciation	.01	.01	.01	.01	.01	.02	.02	.02	.02	.02	.02
Packages	.27	.27	.23	.25	.32	.48	.62	.64	.45	.31	.38
Gross mill costs	4.49	4.43	6.05	5.49	9.16	10.77	11.41	13.18	9.55	6.89	8.09
Feed credit	.65	.75	.83	.76	1.26	1.28	1.44	2.09	1.12	.86	1.10
Net mill costs	3.84	3.68	5.22	4.73	7.90	9.49	9.97	11.09	8.43	6.03	6.99
INDEX NUMBERS, 1913=100											
Wheat	100	98	140	126	214	247	259	300	213	152	184
Labor	100	110	110	100	130	170	210	270	250	200	170
Other mill costs	100	100	100	100	138	200	200	225	238	213	163
General expense	100	113	125	113	163	213	213	275	275	250	175
Depreciation	100	100	100	100	100	200	200	200	200	200	200
Packages	100	100	85	93	119	178	230	237	167	115	141
Gross mill costs	100	99	135	122	204	240	254	294	213	153	180
Feed credit	100	115	128	117	194	197	222	322	172	132	169
Net mill costs	100	96	136	123	206	247	260	289	220	157	182

As shown in the above table, all items entering into the cost of flour continued to advance and reached their highest level in 1920. In the next two years there was a marked decline, more especially in the controlling factor, wheat, with the result that, after crediting the receipts from feed, the average net mill cost of flour manufactured in 1922 was $5.06 per barrel less than in 1920. This represented a decline of 45.6 per cent in two years.

WHEAT COST.—As stated in Chapter IV, the average cost for all companies of the wheat used in the 4-year period was 87 to 90 per cent of the gross mill cost. In the 10-year period the proportion ranged from 87 per cent in 1914 and 1922 to more than 92 per cent in 1917, the average for the period being 90 per cent. As shown by the table, the cost of the wheat ground by the mills fluctuated during the first four years, after which there was a constant increase to the maximum in 1920. The cost of the wheat ground in this year reached $11.85 per barrel, and, as shown by the index number, the increase over the average for 1913 was equivalent to 200 per cent. The decline in wheat prices, that was well under way in the last half of 1920, led to a decrease in the cost of the wheat ground which continued through the next two years, until in 1922 it was only $5.99 per barrel of flour manufactured, or practically one-half of that of 1920, but somewhat more than 50 per cent greater than for 1913.

Comparison of these data shows very clearly that the average results for all companies were largely influenced by the figures for mills in the northwestern group. This was due to the larger volume of wheat ground by the mills in that district. Extending the comparison to the details for the different districts, it will be noted that in some important respects the mills in the southwestern district possessed certain advantages over those in other groups. For example, in six years of the period the cost of wheat ground per barrel of flour manufactured by the southwestern mills was lower than for the northwestern mills, while throughout the entire period their wheat cost was from $0.23 per barrel to $1.08 per barrel lower than for mills in the eastern district.

LABOR COST.—Although the labor cost is a minor factor in the total cost of a barrel of flour, yet the figures show that, as between 1913 and 1920, there not only was a substantial increase in this item, but in the downward course in the last two years the tendency to decline was not so marked as in the case of wheat and packages. It will be observed also that, while the average cost of labor in 1920 was 170 per cent higher than in 1913 and 1916, the decline in 1922 amounted to only 26 per cent as against 49 per cent for wheat and 52 per cent for packages. During the 10-year period the labor cost ranged from a minimum of $0.10 per barrel to a maximum of $0.27 per barrel with an average of $0.17.

As shown in Appendix Table 12, in five years of the period the average cost of labor for the northwestern mills was $0.01 per barrel lower than for the southwestern district, while in three years this item was the same for both groups, but in 1917 and 1920 the southwestern mills had an advantage of $0.02 and $0.01 per barrel, respectively, over those in the northwestern district. Throughout the 10 years the labor cost for the eastern mills was higher than for the other districts. The lowest average labor cost for any district was

$0.09 per barrel for the northwestern district in 1913 and the highest $0.35 per barrel in the eastern district in 1920.

PACKAGE COST.—As stated in Chapter IV, the cost of packages constitutes the largest single item of cost, excepting wheat in producing a barrel of flour. This item, for the 28 companies, includes both flour and feed packages, consequently the figures are not exactly comparable with those for the four-year period shown in Chapter IV. The highest level in both cases was reached in 1920, the range for the 28 companies being from an average of $0.23 per barrel in 1915 to $0.64 per barrel in 1920. Based upon the lowest cost in 1915, the increase amounted to 178 per cent. In the downward course in 1921 and 1922 the package cost decreased 52 per cent. In seven years of the period the average cost of packages, for the southwestern mills was slightly lower than for the northwestern mills, while, excepting 1919 and 1921, this cost for the eastern mills ranged from $0.03 per barrel to $0.18 per barrel higher than for the other groups.

OTHER MILL COSTS.—"Other mill costs" appear to have run along more uniformly than other expense items. After doubling in amount in 1918, as compared with the first four years, the maximum was not reached until 1921, when the index number indicates an increase of 138 per cent. As in the case of labor and general expense, the factors which go to make up the item of other mill costs showed a strong tendency to hold to the highest level. Compared with the larger number of companies in the last four years, the 28 identical companies had an apparent advantage of 1 or 2 cents per barrel. The "other mill costs" were practically the same for all districts for the period, averaging $0.13 per barrel for the group and for the northwestern district, while the other two districts averaged 1 cent higher.

For the whole period the variation was from $0.08 in the first four years to $0.19 per barrel in 1921. The lowest average cost for any district was $0.07 per barrel in the northwestern district for the first four years, while the highest average cost, $0.20 per barrel, was also in this same district in 1921. In the first five years "Other mill costs" for the northwestern mills were $0.02 to $0.05 per barrel lower than for the other groups, while in the last half of the period the margins between the three groups amounted to only $0.01 or $0.02 per barrel, with the advantage for the most part in favor of the eastern mills.

DEPRECIATION.—As already stated, the commission did not revise the depreciation charged by the companies. This item was small for most of them, the average for the 28 companies for the 10-year period being $0.02 per barrel. During the first five years the average for all companies was only 1 cent per barrel. In 1913 only one-half of the companies charged depreciation, in 1918 all but two charged depreciation, while in the last three years 23 of the 28 made a depreciation charge.

GENERAL EXPENSE.—General expense ranged from an average of $0.08 per barrel in 1913 to $0.22 per barrel in 1920 and 1921, an increase of 175 per cent. The decline of 2 cents a barrel in 1922 was hardly appreciable, and rather indicated a tendency to hold to the high level reached in 1920. Salaries constituted the largest single item included in general expense. Comparison of this item for all companies during several years of the period shows three companies paying as low as $0.02 per barrel, while the charge by one company in

1920 amounted to $0.35 per barrel. In the latter case, however, the accounts showed a tendency to minimize profits and to take them in the form of high salaries. About 92 per cent of the salary charges reported were within a range of $0.02 to $0.20 per barrel, the average for all companies being around $0.10 per barrel.

There were great variations in the item of general expense in the different districts. For the whole period the average for all districts was $0.14 per barrel, which was 1 cent higher than for the northwestern district, 3 cents lower than for the southwestern, and 9 cents lower than for the eastern district. The average for the northwestern district was lowest in each year, and that for the eastern was highest. The lowest average general expense was $0.07 per barrel in the northwestern district in three years, while the highest was $0.30 per barrel in the eastern district in 1921.

Gross mill cost.—The "gross mill cost" includes the cost of wheat and the cost of packages, as well as the cost of milling the wheat and of packing the products—flour and feed. During the first four years of the period the average gross mill cost fluctuated from year to year, after which there was a rapid increase until the peak was reached in 1920. In the last two years there was a decided decrease. The changes from year to year were largely due to the cost of the wheat.

Net mill cost.—As already pointed out, the net cost of producing a barrel of flour was computed by treating feed products as by-products, and crediting the receipts therefrom to the total mill cost in order to secure the cost of producing a barrel of wheat flour. The receipts from the sale of bran, middlings, and other by-products obtained in the conversion of wheat into flour are an important factor in the determination of the net results of the business. According to the table, aside from the average cost of the wheat used, in every year, excepting 1921 and 1922, the credit from feed sales exceeded all milling, overhead, and package expenses combined by amounts ranging from $0.11 per barrel in 1913 to $0.76 per barrel in 1920.

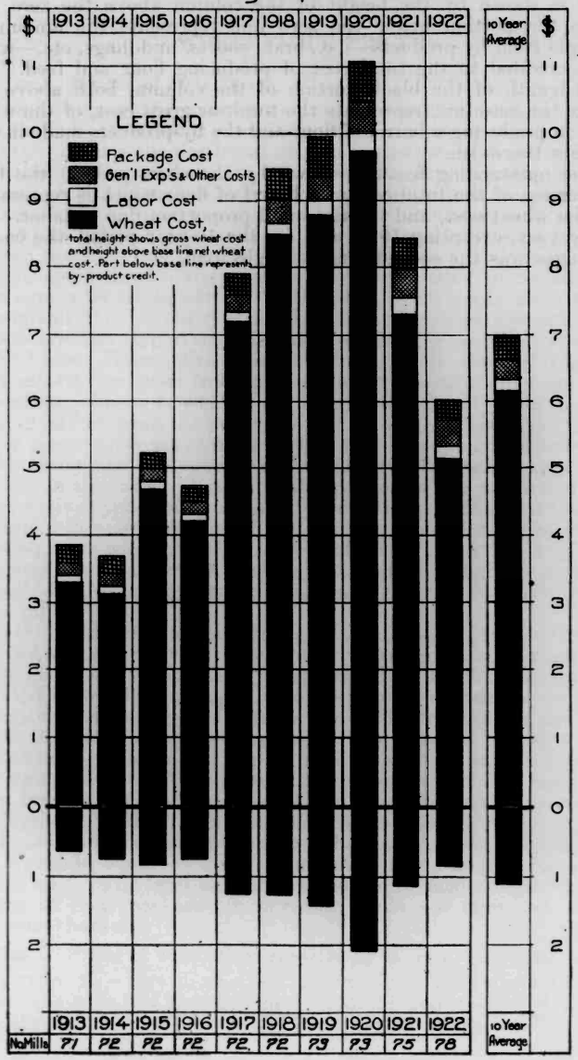
Finally, as shown by the net mill costs, notwithstanding that the feed credits for the eastern mills were larger than for the southwestern group in all years excepting 1921, their net costs were higher in every year. On the other hand, in six years of the period the costs for the southwestern mills were lower than for the northwestern group, while in two years, 1914 and 1916, the margin in favor of the latter amounted to only 1 cent per barrel. Further comparison shows that in the other two years, 1913 and 1918, in which the northwestern mills had the lowest net costs, their advantage in this regard was largely due to the lower cost of the wheat ground.

The average net cost of producing flour for the 10-year period was $6.99 per barrel, which was $0.26 less than the cost of the wheat from which the flour was made, due to a credit for feed of $1.10. The cost varied from $6.86 per barrel in the southwestern district to $7.29 in the eastern district, the northwestern district being $6.97 per barrel. The total costs of flour, however, have been discussed already in the preceding section.

Section 10. Graphic presentation of the principal elements of cost.

Chart 3, opposite, shows graphically the annual average total cost and the principal elements of the cost of producing a barrel of flour

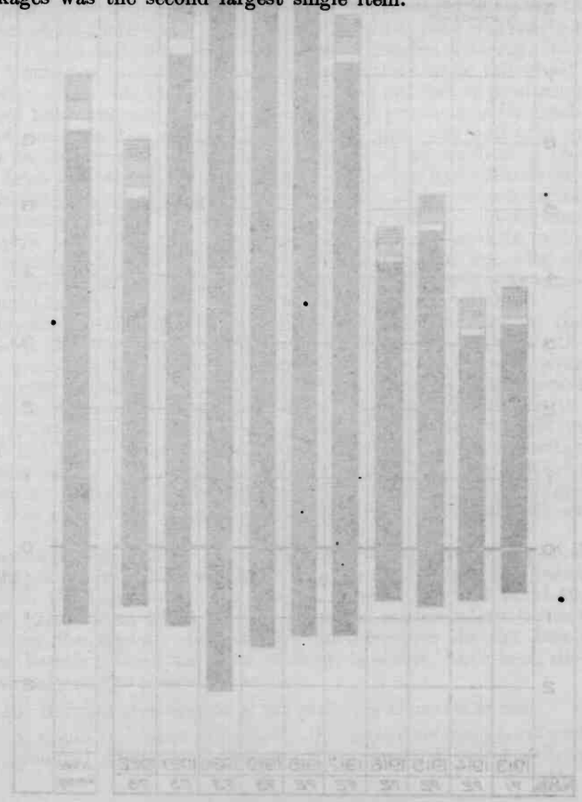
Chart 3-**COMPARISON OF THE ANNUAL AND 10 YEAR AVERAGE MILL COST** and principal items of Cost of Wheat Flour, per barrel, for 28 representative Flour Milling Companies 1913-1922.



for 28 identical companies combined for the 10-year period 1913–1922. The data upon which this chart is based are shown in Appendix Table 12, p. 120.

The total annual average mill cost of producing a barrel of wheat flour is shown by the height of the column above the zero line, while the portion below the zero line represents the amount of receipts from by-products—i. e., bran, shorts, middlings, etc.—which were credited to the total cost of producing flour and feed. The total length of the black portion of the column, both above and below the zero line, represents the total, or gross cost, of the wheat used in producing a barrel of flour and the by-products made in connection therewith.

The outstanding features shown by the chart are (1) the large proportion of the total cost of a barrel of flour which is represented by the wheat cost, and (2) the small proportion due to labor. For every year, excepting 1922, and for the 10-year period the cost of packages was the second largest single item.



Chapter VI

WHEAT-FLOUR PRICES

Section 1. Method of distribution.

The sections of the country where a surplus of wheat is produced and the bulk of the flour is manufactured, as shown in the preceding chapters, include the northwestern and southwestern districts. The principal milling centers in these districts are Minneapolis and Kansas City. From these and other milling centers the product is distributed by rail and water routes to domestic markets or goes into the export trade. The jobbing trade is important, especially in eastern markets, but there is a considerable direct trade with retail grocers and bakers. The grocery store is the chief source of local flour supply for the inhabitants in the cities, small towns, and villages throughout the United States. In the larger cities especially the bakers are also important purchasers of flour, generally buying in carload lots. Bakers often purchase their supplies directly from the flour millers, but more frequently various types of middlemen, such as brokers, jobbers, or wholesalers, intervene and really form the connecting link between the producers and the larger consumers. Some of the larger mills maintain branch houses at populous distributing points throughout the country and supply the retail and bakery trade directly in this way. A considerable portion of the population purchase their supplies of flour directly from the local flour mills, which are found in many sections of the country, especially in the wheat-growing areas where suitable sources of water power are available. The local demand for feed, such as bran and middlings, for domestic animals is also an important factor leading to the establishment of these mills.

In the distribution of flour, bags of cotton, jute, or paper, or barrels of wood are used, varying in contents from a minimum of 2 pounds to a maximum of 196 pounds. Comparatively little flour is now distributed in wooden packages, because wooden containers are more expensive and packages of smaller size facilitate handling and sale. Domestic prices are quoted on the basis of a barrel of 196 pounds packed in 98-pound cotton bags, while in the foreign trade a jute bag containing 140 pounds or a sack of 280 pounds is chiefly used as a basis for price quotation, especially in English-speaking countries. In shipments to Latin countries in Europe and South America price quotations are frequently made on the basis of 100 kilograms or 220.5 pounds, while for Cuba the usual price quotation is for a 200-pound unit. The legal regulations and requirements regarding the weight of flour packages in domestic trade are discussed in the following chapter.

Section 2. Prices of wheat flour reported by millers, 1919-1922.

In order to secure more exact information with respect to flour prices, the principal flour-milling companies were requested to furnish their price quotations to the trade for first-grade family patent

flour, with dates of change for the period 1919–1922. From these data monthly average prices were computed which are shown in the table below. These averages were computed by multiplying each price by the number of days that it was in effect, and dividing by the number of days in each month. During 1919, while wheat prices were still under Government control, flour prices were stable, but in 1920, 1921, and 1922, when there were rapid fluctuations in the market price of wheat, millers made frequent changes in their quotations. In many cases, especially in 1920 and 1921, there were more than 20 changes in the price quotations during a month, and in a number of instances some mills reported two changes in a single day.

The following table shows the monthly average wheat flour prices, based upon quotations secured from flour-milling companies, for the northwestern and southwestern wheat flour-producing districts for the period 1919–1922.

TABLE 30.—*Monthly average price quotations per barrel for first-grade family patent wheat flour, reported by millers by districts, 1919–1922*

Month	Northwestern [1]				Southwestern [1]			
	1919	1920	1921	1922	1919	1920	1921	1922
January	$10.31	$15.02	$9.64	$7.36	$10.08	$12.99	$9.00	$6.19
February	10.43	13.98	9.49	8.28	10.06	12.31	8.88	6.85
March	11.19	13.97	9.25	8.32	10.41	12.07	8.43	7.08
April	12.26	15.01	8.47	8.52	10.97	12.51	7.48	7.08
May	12.73	15.66	8.99	8.49	11.21	13.32	7.75	7.13
June	12.14	14.78	9.42	7.97	11.03	13.07	7.80	6.59
July	12.23	14.21	9.39	8.06	10.61	12.60	6.91	6.37
August	12.23	13.34	8.49	7.35	10.26	11.73	6.63	5.82
September	11.90	13.10	8.47	6.88	10.30	11.87	6.84	5.79
October	12.35	11.59	7.76	6.91	10.49	10.92	6.56	6.09
November	13.23	9.76	7.44	7.12	11.32	9.83	6.28	6.23
December	14.50	9.39	7.40	7.20	12.10	8.91	6.24	6.21
INDEX NUMBERS [2]								
January	100	146	94	71	100	129	89	61
February	101	136	92	80	100	122	88	68
March	109	135	90	81	103	120	84	70
April	119	146	82	83	109	124	74	70
May	123	152	87	82	111	132	77	71
June	118	143	91	77	109	130	77	65
July	119	138	91	78	105	125	69	63
August	119	129	82	71	102	116	66	58
September	115	127	82	67	102	118	68	57
October	120	112	75	67	104	108	65	60
November	128	95	72	69	112	98	62	62
December	141	91	72	70	120	88	62	62

[1] Monthly average prices computed from price changes reported by various flour-milling companies.
[2] January, 1919=100.

According to the table there was a rapid increase in wheat-flour price quotations in the northwestern district from an average of $10.31 per barrel in January, 1919, to the maximum of $15.66 per barrel in May, 1920. This advance was very sharp from September to May, during which time there was a rapid advance in wheat prices. The unprecedented price decline in wheat, which began in June, 1920, led to a precipitate decline in flour prices, which fell to an average of $9.39 per barrel in December, a decrease of $6.27 per barrel in seven months. Prices fluctuated somewhat during the first half

of 1921, but beginning in July a decline set in which continued through January, 1922. During the following six months the tendency was toward a slightly higher level, the average being about $1 per barrel higher than for January. Beginning in August there was a sharp decline, which culminated in the lowest monthly average price for the four-year period, $6.88 per barrel in September, after which there was a moderate advance to an average of $7.20 in December.

The monthly average price quotations in the southwestern district were considerably lower than for the northwestern district, with the single exception of November, 1920. The maximum difference in the monthly average prices was $2.50 per barrel in April, 1920. During the year 1919 the spread between the two districts increased from $0.23 per barrel to $2.40 per barrel, while after the price decline set in this difference gradually lessened.

The monthly average with minor fluctuations ranged from $10.08 per barrel in January, 1919, to the peak price of $13.32 in May, 1920, after which a sharp decline set in which continued through December, when the average was $8.91 per barrel. During 1921 and 1922 prices in the southwestern district generally followed the same trend as the northwestern district, until the minimum average price of only $5.79 per barrel was shown for September, 1922, which was followed by an advance to an average of $6.21 per barrel in December.

Section 3. Quoted market prices of wheat flour, 1913–1923.

The course of wheat-flour prices during the four and one-half year period, 1919–1923, is discussed in this report, and also for the preceding six-year period, 1913–1918, in order that a proper perspective may be obtained.

The unusual conditions affecting all prices during the World War, including abnormal demand, comparatively limited production, lack of transportation facilities, the extraordinary increase in the hazards of ocean transportation, and the various price fixing and other regulations adopted by all the belligerents had the effect of disorganizing all the markets and the channels of distribution. The United States Food Administration, which was established August 10, 1917, continued to function until May, 1919, although certain activities were discontinued December 20, 1918, shortly after the armistice on November 11, 1918. The United States Grain Corporation, on the other hand, continued to operate until May, 1920, and thus indirectly, but in an important way, the production and prices of flour were affected by its activities. Furthermore, prior to the declaration of war by the United States on April 7, 1917, the World War had continued for about three years, during which time this country as a neutral nation was forced to contend with many difficulties in attempting to maintain the usual channels of foreign trade, particularly with other neutral countries located in the vicinity of the warring nations. Consequently, in order to begin with a more normal period when the usual competitive conditions controlled the commerce of the world, the tabulation of the prices was extended backward to include 1913.

PRICE QUOTATIONS AT MINNEAPOLIS.—The location of Minneapolis in the immediate vicinity of the great spring wheat growing area with many flour mills operating in that neighborhood indicated the selection of the flour prices at this market for the

spring wheat flour industry. The following table shows the monthly average market price quotations of hard spring wheat, first patent flour, per barrel, at Minneapolis, together with index numbers for the period 1913–1923.

TABLE 31.—*Monthly average market price quotations of hard spring wheat first patent flour, per barrel, in cotton sacks at Minneapolis, with index numbers, 1913–1923*

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	$4.18	$4.21	$6.71	$6.41	$8.95	$9.89	$10.28	$15.07	$9.96	$7.45	$6.95
February	4.22	4.33	7.33	6.07	8.55	10.10	10.55	14.06	9.53	8.50	7.08
March	4.09	4.31	7.23	5.58	9.45	9.94	11.21	13.74	9.26	8.29	6.97
April	4.36	4.25	7.41	5.95	12.06	9.79	12.22	14.78	8.41	8.55	7.32
May	4.39	4.30	7.42	5.85	15.01	9.31	12.42	15.54	9.17	8.48	7.05
June	4.57	4.18	6.18	5.46	13.22	9.88	12.02	14.51	9.35	7.84	6.60
July	4.45	4.29	6.71	5.91	12.64	10.63	12.16	14.02	9.32	8.14	6.30
August	4.38	5.36	6.31	7.55	12.96	10.49	12.01	12.62	8.54	7.32	6.43
September	4.28	5.56	5.03	8.22	10.89	10.46	11.94	13.03	8.69	6.82	6.54
October	4.16	5.48	5.22	9.08	10.30	10.50	12.63	11.56	7.82	6.77	6.53
November	4.19	5.55	5.20	9.53	10.03	10.51	13.35	9.62	7.60	7.06	6.33
December	4.18	5.70	5.97	8.46	9.93	10.47	14.67	9.39	7.38	7.15	6.38
Annual average	4.29	4.79	6.39	7.01	11.17	10.16	12.12	13.16	8.75	7.70	6.71
INDEX NUMBERS (1913=100)											
January	97	98	156	149	209	231	240	351	232	174	162
February	98	101	171	141	199	235	246	328	222	198	165
March	95	100	169	130	220	232	261	320	216	193	162
April	102	99	173	139	281	228	285	345	196	199	171
May	102	100	173	136	350	217	290	362	214	198	164
June	107	97	144	127	308	230	280	338	218	183	154
July	104	100	156	138	295	248	283	327	217	190	147
August	102	125	147	176	302	245	280	294	199	171	150
September	100	130	117	192	254	244	278	304	203	159	152
October	97	128	122	212	240	245	294	269	182	158	152
November	98	129	121	222	234	245	311	224	177	165	148
December	97	133	139	197	231	244	342	219	172	167	149
Annual average	100	112	149	163	260	237	283	307	204	179	156

These average price quotations were obtained by taking one-half of the sum of the highest and lowest weekly price quotations of hard spring wheat first patent flour in cotton or jute sacks at Minneapolis, as reported by the Northwestern Miller. Wheat flour, as it is quoted on the open market, is primarily classified into patent, straight, and clear grades. Within each of these principal categories, several subsidiary classifications are found, while many specific brands are manufactured by the several mills. The highest grade of hard spring wheat patent flour reported during the period was selected. During the period of control by the United States Food Administration, September, 1917–December, 1918, the quality of flour produced was under strict regulation. At first 285 pounds of wheat was allowed for the manufacture of one barrel of flour or 68.8 per cent extraction. Later this was changed to 264 pounds or 74.3 per cent. Toward the end of December, 1917, the maximum limit of low-grade flour to be made was fixed at 5 per cent; consequently at that time the price quotations are for 95 per cent flour. On February 15, 1918, the use of substitutes in the baking of bread became mandatory (1 pound in 4) and at the beginning of March the manufacture of 100 per cent flour was authorized. These regulations, of course, affected the quality of the product which was manufactured by all

millers during 1918. Many of the milling regulations were canceled on December 20, 1918.

An exhibit, giving also the price quotations at Kansas City, with index numbers, is shown in Appendix Table 13, page 124. Chart 4, opposite page 78, shows the trend of price quotations at Minneapolis and Boston, together with the price of 4½ bushels of wheat.[1]

The monthly average price of the hard spring wheat first patent flour f. o. b. mill Minneapolis was quite uniform during the 19 months ending with July, 1914. The range in the monthly average was from $4.09 per barrel in March, 1913, to $4.57 per barrel for June of the same year. This uniformity of flour prices was due to the fact that wheat prices were very stable.

Notwithstanding the fact that a large crop of wheat was harvested in 1914, both wheat and flour prices increased sharply, the average for flour increasing from an average of $4.29 in July to $5.70 per barrel in December, as a result of the outbreak of the World War. This continued until an average price of $7.42 per barrel was reached in May, 1915. During the next four months the monthly average price of flour fell precipitately to an average of $5.03 per barrel in September. Two dominating factors combined to produce this temporary decline in flour prices: (1) The operations of the belligerents interrupting transportation in export trade, and (2) the large crops of wheat harvested in the United States, Canada, and Australia. Despite the heavy war demand, flour prices remained lower until August, 1916, than in the previous high-price month of May, 1915. The 1916 wheat crop was a small one, only 636,000,000 bushels, and as a result flour prices advanced sharply, with minor fluctuations, until a new high monthly average of $15.01 per barrel for flour was reached in May, 1917. The 1917 wheat crop was also a small one. 637,000,000 bushels, and there were practically no stocks of old-crop wheat, while few shipments could be made from Australia and Argentina owing to the scarcity of ocean tonnage and the hazard of long ocean voyages. September 1, 1917, the price of wheat in the United States was fixed, and the duty of controlling wheat prices was assigned to the United States Food Administration. Later the profits of flour milling concerns were fixed at $0.25 per barrel, with certain provisions regarding the disposition of feeds. As soon as wheat prices were stabilized, flour prices began a decline, which continued almost without interruption through May, 1918, when the monthly average was $9.31 per barrel. In the summer of 1918 the price of wheat was increased $0.06 per bushel effective July 1, 1918, and at that time there was a considerable increase in the price of flour. The monthly average price was fairly uniform for the last six months of 1918.

Soon after the armistice, November 11, 1918, some of the Food Administration regulations affecting flour were discontinued. For example, the official regulations governing the percentage of flour extraction and those governing sales of flour for future delivery were withdrawn. The United States Grain Corporation was required, however, to maintain the minimum wheat prices for the 1919 crop marketed before June 1, 1920. This continued stabilization of grain prices tended to stabilize flour prices also, since the millers purchased their principal raw material at fixed prices.

[1] Four and one half bushels is the approximate wheat equivalent of a barrel of flour.

Beginning in February, 1919, a price advance began which continued with minor fluctuations until a maximum monthly average price of $15.54 was reached in May, 1920. This was the peak price for the 11-year period 1913–1923, and was $0.53 per barrel higher than the monthly average for May, 1917. The high prices of May, 1917, and May, 1920, were both chiefly due to high wheat prices. The high wheat prices of 1917 were partly due to the small 1916 wheat crop and the poor prospects for 1917 and partly to the British wheat corner on the Chicago Board of Trade. The high level reached in 1920 was mainly due to heavy purchases of wheat in the spring of that year by foreign governments, especially by the British Royal Commission.[2]

Following the peak price in May, foreign purchasers of wheat withdrew from the American market and in consequence wheat prices declined. This downward movement in wheat was reflected by a drop in flour prices which continued, with some interruptions, until it reached $7.38 per barrel in December, 1921. During this period of about a year and a half, therefore, the average monthly price declined from $15.54 per barrel to $7.38 per barrel, a decrease of $8.16 per barrel. Wheat prices fell even more sharply, namely, from a monthly average of $2.97 per bushel in May, 1920, for No. 2 wheat at Chicago, to $1.13 per bushel in December, 1921.

During the first four months of 1922 there was an upward movement in both wheat and flour prices. Apparently speculation in wheat futures had considerable influence upon wheat prices, which in turn led to a higher level of flour prices.[3] The decline in flour prices which began in May was less precipitate than for wheat. In the latter part of 1922 flour prices reached a lower level than in 1921, and in 1923 they sank still further.

The maximum monthly average for 1922 was $8.55 per barrel in April and the minimum $6.77 per barrel in October. Beginning with November, 1922, there was a gradual increase with minor fluctuations to $7.32 per barrel in April, 1923, which was followed by a sharp decline to $6.38 per barrel in December. July, 1923, had the lowest post-war monthly average price, $6.30 per barrel, for the period 1919–1923. These low flour prices in 1923 followed the marked decline in wheat prices.

Throughout the eleven-year period the lowest annual average price was $4.29 per barrel in 1913, and the highest $13.16 for 1920. There was a marked decline in the annual average price for 1921, which was $8.75 per barrel, or only two-thirds that of 1920. The decline in the annual average price of wheat flour continued during the next two years, the average for 1923 being $6.71 per barrel, which was the lowest since 1915.

Price quotations at Kansas City.—Kansas City is the outlet for the chief hard winter wheat flour milling region in the United States. The general conditions affecting the prices of flour during the period 1913–1923 were discussed in preceding paragraphs devoted to the Minneapolis market. While the bulk of wheat grown in the Kansas City region is hard winter wheat, some millers operating in this area grind hard spring or soft winter wheat and quotations for soft winter wheat flour are made in the Kansas City market.

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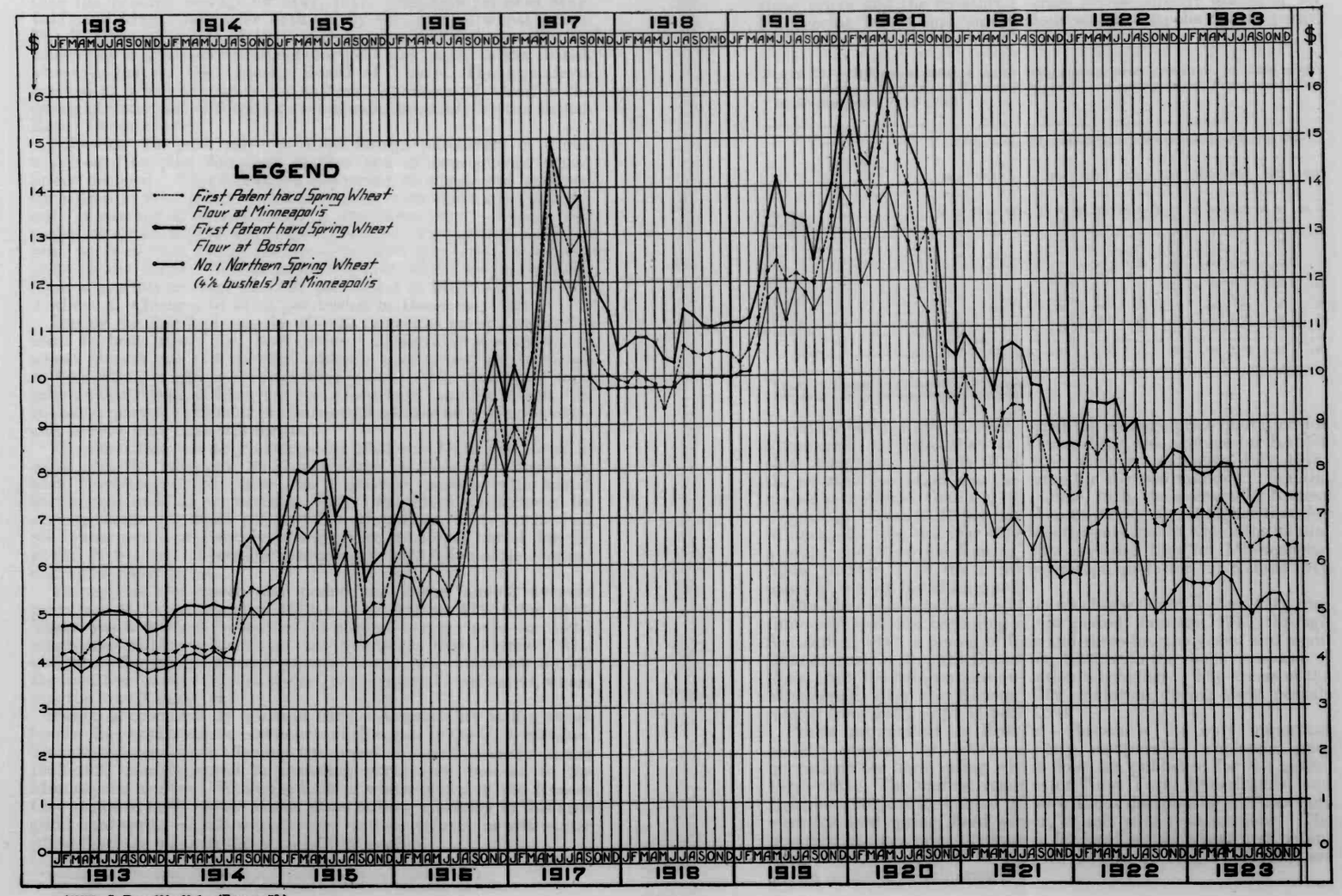
[2] Federal Trade Commission, Methods and Operations of Grain Exporters, vol. 2.
[3] Federal Trade Commission, Methods and Operations of Grain Exporters, vol. 1, ch. 2.

Chart 4 – MONTHLY AVERAGE PRICE QUOTATIONS, PER BARREL, FOR FIRST PATENT HARD SPRING WHEAT FLOUR AT MINNEAPOLIS AND BOSTON, IN 98 POUND COTTON SACKS, AND FOR 4½ BUSHELS OF NO. 1 NORTHERN HARD SPRING WHEAT AT MINNEAPOLIS, 1913–1923.



The monthly average market prices for hard winter wheat, first patent, flour per barrel, in cotton or jute sacks, at Kansas City, with index numbers for the period 1913–1923, are shown in Appendix Table 13, page 124. The following table shows the differences between these prices and the monthly average prices, already discussed, for hard spring wheat, first patent, flour at Minneapolis for the period 1913–1923.

TABLE 32.—*Differences between the monthly average price quotations for hard winter wheat, first patent flour, at Kansas City, and hard spring wheat, first patent flour, at Minneapolis, 1913–1923*

Month	Excess of monthly average price at Minneapolis over Kansas City										
	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	$0.26	$0.26	$0.46	$0.66	$0.12	[1] $0.21	$0.17	$0.99	$0.72	$0.83	$0.55
February	.28	.38	.31	.33	.17	[1] .15	.25	1.42	.58	1.18	.69
March	.21	.33	.45	.45	.15	[1] .37	.50	.74	.57	.85	.53
April	.37	.25	.61	.75	.15	[1] .52	.28	1.26	.67	.99	.71
May	.36	.30	.74	.77	.57	[1] 1.07	[1] .57	1.02	.95	.98	.52
June	.42	.20	.37	.64	.38	[1] .50	.02	.63	1.06	.73	.52
July	.35	.71	1.13	.77	.69	(2)	1.05	.57	.87	1.15	.76
August	.31	1.03	.77	.65	.55	.25	1.31	.22	1.55	1.10	.67
September	.09	.19	.12	.82	.16	.31	.96	.49	1.39	.71	.49
October	.15	.40	.31	1.00	[1] .20	.36	1.07	.48	.83	.39	.31
November	.24	.57	.22	.46	[1] .29	.30	1.28	.34	1.06	.59	.33
December	.23	.51	.79	.43	[1] .07	.35	1.15	.20	.82	.64	.47
Year	.27	.42	.52	.64	.20	[1] .11	.62	.68	1.02	.85	.55

[1] Excess of Kansas City prices over Minneapolis.
[2] Monthly average the same for both markets.

During most of this 11-year period the average price quotation for Minneapolis exceeded that for Kansas City, the average for Kansas City being higher for only 10 months, while in one month, July, 1918, the average quotation was the same for the two markets. For the nine-month period, October, 1917–June, 1918, the average for Kansas City ranged from $0.07 per barrel to $1.07 per barrel higher than for Minneapolis, and the year 1918 was the only one in which the annual average quotation for Kansas City exceeded that for Minneapolis. Again, in May, 1919, the monthly average quotation for Kansas City was higher than for Minneapolis.

The Minneapolis price quotation was higher than Kansas City continuously from the beginning of the period, January, 1913, through September, 1917, a period of four and three-fourths years, and again from August, 1918, until December, 1923, with the single exception of May, 1919, the Minneapolis quotation was higher. The excess of the Minneapolis over the Kansas City quotation during these periods ranged from $0.02 to $1.55 per barrel.

PRICE QUOTATIONS AT BOSTON.—Boston is the only important eastern market for which strictly comparable wholesale price quotations for hard spring wheat flour are published for the period 1913–1923. The market reports for New York, Philadelphia, and Baltimore frequently quoted prices without designating whether they were for hard spring, hard winter, or soft winter wheat flour. The monthly average price quotations for hard spring wheat first patent flour in cotton sacks of 98 pounds, in carload lots, at Boston, are shown in the table following:

TABLE 33.—*Monthly average market prices of hard spring wheat, first patent flour, per barrel, in cotton sacks, at Boston, with index numbers (average for 1913=100) 1913–1923*

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	$4.76	$5.08	$7.49	$7.36	$10.24	$10.65	$11.12	$16.06	$10.84	$8.48	$7.98
February	4.78	5.18	8.05	7.28	9.73	10.83	11.23	14.63	10.53	9.39	7.86
March	4.65	5.19	7.98	6.64	10.50	10.83	11.88	14.44	10.19	9.38	7.90
April	4.89	5.16	8.23	6.99	12.83	10.68	13.31	15.50	9.65	9.37	8.09
May	5.03	5.21	8.27	6.93	14.98	10.38	14.22	16.37	10.53	9.41	8.07
June	5.09	5.16	7.04	6.52	14.09	10.29	13.38	15.78	10.63	8.78	7.40
July	5.08	5.13	7.47	6.70	13.57	11.41	13.33	14.95	10.48	9.02	7.17
August	5.00	6.43	7.34	8.28	13.82	11.28	13.25	14.41	9.75	8.19	7.48
September	4.86	6.63	5.68	9.00	12.20	11.04	12.44	14.00	9.73	7.88	7.62
October	4.64	6.28	6.09	9.76	11.76	11.02	13.44	12.98	8.90	8.06	7.54
November	4.69	6.52	6.24	10.51	11.39	11.06	14.01	10.59	8.49	8.34	7.38
December	4.75	6.66	6.78	9.51	10.54	11.12	15.59	10.40	8.53	8.30	7.38
Annual average	4.85	5.72	7.22	7.96	12.14	10.88	13.10	14.18	9.85	8.72	7.66
INDEX NUMBERS											
January	98	105	154	152	211	220	229	331	224	175	165
February	99	107	166	150	201	223	232	302	217	194	162
March	96	107	165	137	216	223	245	298	210	193	163
April	101	106	170	144	265	220	274	320	199	193	167
May	104	107	171	143	309	214	293	338	217	194	166
June	105	106	145	134	291	212	276	325	219	181	153
July	105	106	154	138	280	235	275	308	216	186	148
August	103	133	151	171	285	233	273	297	201	169	154
September	100	137	117	186	252	228	256	289	201	162	157
October	96	129	126	201	242	227	277	268	184	166	155
November	97	134	129	217	235	228	289	218	175	172	152
December	98	137	140	196	217	229	321	214	176	171	152
Annual average	100	118	149	164	250	224	270	292	203	180	158

The monthly average price quotations shown above are presented graphically in Chart 4 (opposite p. 78). Flour made from the soft winter wheat grown east of the Mississippi River, from the hard winter wheat of Nebraska, Kansas, and Oklahoma, and from the hard spring wheat of Minnesota and the Dakotas is all sold regularly in this market. A comparison of the monthly average price quotations for Minneapolis, which are also indicated on the chart, shows that the Boston price was uniformly higher than that for Minneapolis throughout the entire period with the single exception of May, 1917.

The annual average price quotations in the Boston market increased from a minimum of $4.85 in 1913 to a maximum of $14.18 per barrel in 1920, and then declined rapidly to $7.66 per barrel in 1923. The most marked increase in a single year was $4.18 per barrel between 1916 and 1917, while the largest decline was $4.33 per barrel from 1920 to 1921. The increase from the low annual average for 1913 to the peak price in 1920 was $9.33 per barrel, while the decline from the peak price amounted to $6.52 per barrel in 1923.

As already stated, with the exception of May, 1917, the monthly average price quotation of flour at Boston was higher than at Minneapolis, the range being from $0.41 to $1.80 per barrel. In May, 1917, flour prices at Minneapolis were abnormally high, as a result of the highly speculative condition of the wheat market following the heavy purchases of wheat futures on the Chicago Board of Trade by the Allies. In order to stop the upward trend of wheat prices, about the middle of May all of the grain exchanges in this

country fixed maximum settlement prices on future contracts for May delivery and limited further trading in May futures to the settlement of existing contracts. About the same time maximum prices were fixed for July and September futures. As a result of this action flour prices declined rapidly, and in June the Boston price quotation averaged $0.87 per barrel above Minneapolis. Due to increased freight rates, especially after August 26, 1920, the spread between Boston and Minneapolis became larger, the annual average spread being $1.02 in 1920, $1.10 in 1921, $1.02 in 1922, and then declining to $0.95 in 1923.

GRAPHIC PRESENTATION OF WHEAT AND FLOUR PRICES.—As already stated, monthly average market price quotations for No. 1 northern hard spring wheat, at Minneapolis, and hard spring wheat first patent flour at Minneapolis and Boston are presented in Chart 4, opposite page 78, for the period 1913–1923. The monthly average wheat prices are charted for 4½ bushels, which is the approximate quantity ground to produce a barrel of flour. (See Appendix Table 14.)

The chart shows that the spread between the monthly average price of flour and the value of the wheat equivalent (4½ bushels) at Minneapolis was much greater beginning about January, 1920, than prior to that time. This increase in the spread in 1920 was partly due to the fact that the cost of milling and packing wheat flour was greater than formerly and partly to the fact that profits were higher in that year. (See pp. 44, 52, 67, and 118.) In 1921 and 1922 milling costs decreased only slightly, but profits were much smaller than in 1920. The chart shows that Minneapolis flour quotations responded promptly to changes in wheat prices.

The monthly average flour quotations at Minneapolis and Boston generally show the same trend, and, as already pointed out, the average spreads between the two prices were greater after 1920 than for the earlier years. The wider spread in the later years was partly due to higher transportation charges.

Section 4. Prices of bread.

While this inquiry under the terms of the resolution was not directed to the study of bread prices or the profits of bakers, a comparison of the wholesale price quotations of flour with the retail prices of bread is made for the period under review, based on available published data.

The distinction between quoted and actual prices should be borne in mind. The former represent the "asking" or first-hand offering prices common to most mercantile selling transactions, and for tracing the trend of prices they serve all practical purposes. Actual prices, on the other hand, represent the net returns from sales by the mills, which probably are slightly lower on the average than the published quotations. The prices for bakers' bread are the usual selling prices in certain cities as reported by the Bureau of Labor Statistics.

The bulk of the bread sold at retail is made by bakeries which purchase flour in large quantities, sometimes directly from the millers but often through flour jobbers. Except where the bakeries are located near the mills supplying them, there is a considerable item of freight included in the cost of the flour used which often amounts to from one-fourth to one-third of a cent for a pound loaf of bread.

A more exact presentation of the important factors in the price of bread would, of course, be much more satisfactory, but this would require a careful study of the operations of representative bread-baking companies and retail dealers. Reports of the United States Food Administration [3] and of the State of Minnesota [4] have been utilized for certain basic facts regarding the baking industry in the United States. The quantity of bread produced from a barrel of flour usually averages from 275 to 280 one-pound loaves, depending primarily upon the quality (gluten content) of the flour and the efficiency of the baker. Ordinarily the other ingredients in a loaf of bread are milk and water, shortening, sugar, yeast, and salt. Each baker has his own formula for the material content of the dough, and generally 18 ounces of dough are required to make a 16-ounce or 1-pound loaf of bread.

A comparison is made, in the table below, between the annual average wholesale price quotations of flour and the annual average retail prices of bread in Minneapolis, Kansas City, and Boston for the period 1913–1923:

TABLE 34.—*Annual average wholesale price quotations of flour and retail prices of bread at Minneapolis, Kansas City, and Boston, 1913–1923*

[In cents per pound]

Year	Minneapolis		Kansas City		Boston	
	Wholesale flour	Retail bread	Wholesale flour	Retail bread	Wholesale flour	Retail bread
1913	2.2	5.6	2.1	6.0	2.5	5.9
1914	2.4	5.7	2.2	6.1	2.9	6.0
1915	3.3	6.4	3.0	7.1	3.7	6.5
1916	3.6	6.9	3.2	7.8	4.1	6.8
1917	5.7	9.5	5.6	10.2	6.2	8.8
1918	5.2	8.9	5.2	10.0	5.6	9.0
1919	6.2	9.5	5.9	9.9	6.7	9.4
1920	6.7	10.7	6.4	12.5	7.2	11.2
1921	4.5	9.5	4.0	10.4	5.0	10.0
1922	3.9	8.8	3.5	7.8	4.4	8.5
1923	3.4	9.0	3.1	8.2	3.9	8.4

As shown by the table, the annual average wholesale price quotations of flour at Minneapolis, which in 1913 was 2.2 cents per pound, increased continuously to 5.7 cents in 1917, and later to a maximum price of 6.7 cents per pound in 1920, declining thereafter to 3.4 cents in 1923. For bread the annual average price, which was 5.6 cents per pound in 1913, reached a maximum of 10.7 cents in 1920, thereafter declining to 9 cents in 1923.

At Kansas City the average price for wholesale flour was 2.1 cents per pound in 1913, reached a maximum of 6.4 cents in 1920, and then rapidly declined to 3.1 cents in 1923. Retail bread prices started at a higher level at Kansas City than in Minneapolis, and averaged higher during most of the period. In fact, it was only during the last two years of the period that the price of bread became lower in Kansas City than in Minneapolis, although the annual average price of wholesale flour was lower for 10 years and the same for 1 year. The

[3] Report of Federal Trade Commission on bakery business in United States, November, 1917, to the United States Food Administration.

[4] Production, Distribution, and Prices of Bread, Minnesota State Department of Agriculture, January, 1920.

retail price of bread was higher in Kansas City than either in Minneapolis or in Boston, except during the last two years of the period. A "bread war" in Kansas City, which began early in 1922, was apparently the cause of lower average prices for 1922 and 1923.

Although, as would be expected, the price of wholesale flour was higher in Boston than in Minneapolis, the annual average price of a pound loaf of bread was higher in Minneapolis in 1916, 1917, 1919, 1922, and 1923 than in Boston.

The spreads or differences between the average wholesale price quotations for flour and the retail prices of bread from year to year tend to indicate in a very rough way the variations in the amounts absorbed by the aggregate costs and profits of flour jobbing, freights, and commercial bread-baking companies for the particular markets under consideration. A careful study, however, of the flour-jobbing and bread-baking businesses would not only enable a separation to be made between the costs and profits covered by these spreads but also would doubtless develop considerable differences both in their trends and in their amounts from that obtained by a mere comparison of prices. These annual average spreads are given in the following table:

TABLE 35.—*Annual average excess, in cents per pound, of the retail price of bread over the wholesale price of flour, 1913–1923*

Year	Minneapolis	Kansas City	Boston	Year	Minneapolis	Kansas City	Boston
1913	3.4	3.9	3.4	1919	3.3	4.0	2.7
1914	3.3	3.9	3.1	1920	4.0	6.1	4.0
1915	3.1	4.1	2.8	1921	5.0	6.4	5.0
1916	3.3	4.6	2.7	1922	4.9	4.3	4.1
1917	3.8	4.6	2.6	1923	5.6	5.1	4.5
1918	3.7	4.8	3.4				

The annual average spread between the retail price of bread over the wholesale price quotations for flour ranged from 3.1 to 5.6 cents per pound at Minneapolis during this 11-year period, from 3.9 to 6.4 cents at Kansas City, and from 2.6 cents to 5 cents per pound at Boston. This spread was lower for Boston than for Kansas City in each year of the period, and lower than, or the same as, Minneapolis.

The above statistics show one thing very definitely, and that is that the development of the bread-baking industry has not lowered the price of bread and that the price of bread is not sensitive to a reduction in the cost of flour. In other words, the bread-baking industry has developed a power of resistance to conditions of supply and demand in flour.

Section 5. Comparison of wheat, flour, and bread prices.

Prices of wheat, flour, and bread increased from 1919 to 1920. In the case of wheat and hard winter wheat flour in the southwestern district the monthly average price reached its peak in May, 1920, while hard spring wheat flour prices in the northwestern district reached their peak in May of the same year, after which there was a sharp decline for both wheat and flour, which continued downward with only minor fluctuations through 1921, 1922, and 1923. Bread prices, on the other hand, decreased only slightly from 1920 to 1923.

As shown above, monthly average quoted prices for hard spring wheat flour in the northwestern district (first family patent) based upon millers' quotations f. o. b. mill increased from $10.31 per barrel in January, 1919, to $15.66 per barrel in May, 1920, an increase of 52 per cent, and then declined to $6.88 per barrel in September, 1922, or 33 per cent below the January, 1919, average price. The monthly average quotation for the same grade of hard winter wheat flour in the southwestern district increased from $10.08 per barrel f. o. b. mill in January, 1919, to $13.32 per barrel in May, 1920, an increase of 32 per cent, and then declined to $5.79 per barrel in September, 1922, or 43 per cent below the January, 1919, average price.

The annual average purchase price of wheat for companies whose business year ended in December for all districts was $2.36 per bushel in 1919, $2.54 per bushel in 1920, then declined to $1.49 per bushel for 1921 and to $1.24 per bushel in 1922. There was considerable difference for different sections of the country, as shown in the following table:

TABLE 36.—*Annual average purchase prices of wheat per bushel f. o. b. mills by flour milling companies by districts, 1919–1922*

District	1919	1920	1921	1922
Northwestern	$2.38	$2.56	$1.54	$1.29
Southwestern	2.30	2.56	1.41	1.17
Mountain and coast	2.18	2.25	1.19	1.17
Southeastern	2.41	2.58	1.58	1.30
Central and eastern	2.41	2.41	1.61	1.37
All districts	2.36	2.54	1.49	1.24

The annual average purchase prices f. o. b. mill were generally somewhat higher in the southeastern and central and eastern districts and lowest for the mountain and coast districts. The annual average price of hard spring wheat used by millers in the northwestern district was slightly higher in 1919, 1921, and 1922 (but the same in 1920) than the hard winter wheat consumed by millers in the southwestern district. The decrease in the annual average price from 1920 to 1922 was slightly more than 50 per cent for all districts, 48 per cent in the mountain and coast district, about 43 per cent in the central and eastern, about 50 per cent in the northwestern and southeastern districts, and nearly 55 per cent in the southwestern district.

The monthly average price of No. 1 northern hard spring wheat at Minneapolis increased from $2.21 per bushel in January, 1919, to $3.09 per bushel in May, 1920, an increase of 40 per cent, and then fell to $1.10 per bushel in September, 1922, or 50 per cent below the average price in January.[5]

In Kansas City the monthly average price of No. 2 hard winter wheat increased from $2.31 per bushel in January, 1919, to $2.93 per bushel in May, 1920, an increase of 27 per cent, and then declined to $1.04 per bushel in September, 1922, or 55 per cent below the average price of January, 1919.

[5] See United States Department of Agriculture, The Wheat Situation, 1923, p. 97.

Data collected and published by the United States Bureau of Labor Statistics show that bread prices have not decreased in like degree with the prices of wheat and flour. For example, in Minneapolis the retail price of a 1-pound loaf of bread was 9.2 cents in January, 1919, and 9 cents in September, 1922; in Kansas City it was 9.3 cents per pound in January, 1919, and 7.9 cents in September, 1922; in Boston, 9.1 cents per pound in January, 1919, and 8.5 cents in September, 1922; and in New York City, 10 cents in January, 1919, and 9.8 cents in September, 1922.

From January, 1919, to September, 1922, the monthly average quoted prices of flour declined 33 per cent in the northwestern district and 43 per cent in the southwestern district, wheat prices declined 50 per cent in Minneapolis and 55 per cent in Kansas City, while bread prices declined about 2 per cent in Minneapolis, about 15 per cent in Kansas City, due to a price war, 6.6 per cent in Boston, and 2 per cent in New York City. Appendix Table 15 shows the monthly average price of bread per 1-pound loaf in 24 different cities. This comparison shows that the decline in wheat prices, so disastrous to the farmer, has benefited the purchaser of bread very little.

Chapter VII

FLOUR AND FEED PACKAGES

Section 1. Origin and source of information.

The great diversity in the weights of different flour packages has caused many difficulties, and the need of standardization has been recognized in the flour-milling industry for many years. Efforts made through State and Federal legislation to bring about reforms which would relieve the flour millers of the annoyance due to conflicting State laws and customs and at the same time eliminate the opportunities for abuses which are an outgrowth of the existing situation have accomplished very little. Up to the present time the only important laws enacted are those requiring that the weight contents of packages shall be marked thereon.

The package requirements of different States were made the subject of special consideration in this inquiry because the industry has been endeavoring to have them reformed and also because the consumer, as a consequence of the added expense of packing in so many different-sized packages, must ultimately pay a higher price for his flour.

The information on this subject was obtained through the cooperation of various State officials, and in many instances aid was received from municipal officials, also, and from flour-milling companies.

Section 2. Wheat-flour packages in use by law, regulation, or custom.

As a result of a special inquiry addressed to various State and local officials and milling companies comprehensive information was obtained with respect to the weights of the different sizes of flour packages prescribed either by law or by regulation or in use by virtue of local trade custom. Package weights prescribed by law are weights specifically named by statute, while those prescribed by regulation are weights designated by State officials who are authorized by statute to make rules and regulations.

Not less than 34 different-sized packages are authorized or in use for the domestic trade in the various States. Reports from millers showed 25 different sizes in use, two of which, 110 and 80 pound packages, were not reported by State or municipal authorities. The 110-pound sack is evidently used in the export trade to Latin countries, as it is one-twentieth of a metric ton. Under the laws of some States other sizes of packages are permitted, provided the weight content is indicated on the package or container. It was not practicable in all cases to obtain a complete list of the packages customarily in use.

Twelve States and the District of Columbia have no laws or regulations fixing the size of flour packages or containers. These States are Arizona, Colorado, Florida, Montana, New Hampshire, New Jersey, New Mexico, New York, Utah, Vermont, Washington, and Wyoming. On the other hand, there are 33 States in which the law prescribes the standard weight of a barrel of flour; 2 States

in which it is fixed by regulation at 196 pounds; and in Texas the law provides for a 200-pound barrel, though the 196-pound barrel is in use by custom. In South Carolina, in addition to the 196-pound container, there is also, by regulation, a 192-pound sack, a 98-pound half barrel in wood, and a 96-pound sack.

The weights for flour packages prescribed by law or regulation or established by trade custom in the different States are shown in the following table:

Table 37.—*Package weights for wheat flour prescribed by law or regulation or in use by custom, by States, in 1922*

[L=Prescribed by law; R=By regulation; C=In use by custom.]

State	Weight of package contents (pounds)																
	200	196	140	100	98	96	50	49	48	25	24½	24	12½	12	10	6	5	Other sizes
Alabama [1]		R				R			R			R		R		R		
Arizona [1]		C							C			C			C		C	
Arkansas [1]		L			C	C			C			C			C		C	
California [1]		R	C		R			R			R							
Colorado		C		C	C		C		C	C		C		C	C	C	C	19–C.
Connecticut [1]		L			C			C	C		C			C			C	
Delaware [1]		L			L						C	C		C			C	
Florida [1]		C			C	C			C			C		C		C		
Georgia [1]		L	L			L			L			L		L		L		280–L.
Idaho		L	C		L			L				L		L				
Illinois [1]		L	C		L			L	C		L	C	C				C	9.5–4.5–C.
Indiana [1]		L	C		C			C	C		C	C	C	C	C	C	C	20–C.
Iowa [1]		L	C	C	C		C	L	C	C	C	C	C	C	C	C	C	3.5–C.
Kansas [1]		L	C		L				L			L		L				
Kentucky		L			C				C			C		C		C		
Louisiana [1]		L	C		C				C			C						141–C.
Maine [1]		L			C			C			C		C					
Maryland [1]		L	C		C				C			C		C		C	C	2–C.
Massachusetts [1]		L			C			C			C		C	C	C	C	C	4, 3, 2–C.
Michigan [1]		L	C		L			L			L		L					6½–L.
Minnesota		L	C		L			L			L		L				C	
Mississippi [1]		L			L	C			L			L		C		C		
Missouri [1]		L	C		L				L			L		C	C	C	C	
Montana		C			C			C			C	C						9–C.
Nebraska [1]		L	C		L				L			L		L		L		
Nevada [1]		L			L			L				L		L				
New Hampshire		C			C						C		C				C	
New Jersey [1]		C			C			C			C	C	C	C	C	C	C	7, 3.5, 2–C.
New Mexico [1]		C			C				C			C		C		C	C	
New York [1]		C	C		C			C	C		C	C	C	C	C		C	8, 7, 3.5, 2–C.
North Carolina [1]		L			L				L			L		L		L		
North Dakota [1]		L	C		L			L	C		L		C		C			
Ohio [1]		L	C		C			C			C		C					
Oklahoma [1]		L	C		L				L			L		C		C		
Oregon [1]		L	C		L			L			L							9.8–L.
Pennsylvania [1]		L	C		L			R			R			R			R	2–R.
Rhode Island [1]		L			C			C			C		C	C			C	3–C.
South Carolina [1]		L			R	R			R			R		R		R		192–R.
South Dakota [1]		L			L			L			L		L					
Tennessee [1]		L	C			C			C			C		C		C		
Texas [1]	L	C	C	L	C	C	L		C	L		C		C		C	C	
Utah [1]					C				C			C		C	C		C	9–C.
Vermont [1]		C			C			C			C			C			C	2–C.
Virginia [1]		L	C		L				R			R		R		R		
Washington		C	C		C			C			C	C						9.8, 4.9–C.
West Virginia [1]		L			L			L			L		L					
Wisconsin [1]		L	C		C			C			C		C		C		C	
Wyoming [1]		C			C				C			C			C			
District of Columbia		C			C				C			C		C		C	C	

[1] States requiring the weight of contents to be marked on package.

In 13 States the standard barrel only is prescribed by law, all other packages being in use by custom. These States are Arkansas, Connecticut, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Ohio, Rhode Island, South Carolina, Tennessee, and Wisconsin. Maine and Ohio have exact fractional parts of

the standard barrel, while below the half-barrel size all the Southern States in this group use an exact fraction of a 192-pound barrel. Besides the standard barrel, reports from Connecticut show six other packages in use by custom, with two sizes for the quarter barrel, while Indiana has 11 such packages, with two weights in the quarter, eighth, and sixteenth barrel sizes.

Alabama by regulation and Georgia by law have the standard 196-pound barrel, while the half-barrel and all smaller packages are even fractions of a 192-pound barrel. Georgia is the only State prescribing the 140 and 280 pound packages by law.

The Delaware law prescribes the standard barrel and half barrel only, four smaller sizes being in use by custom, with two weights for an eighth of a barrel. Utah appears to be the only State where flour is not packed or sold in the barrel-size package.

In addition to the standard barrel and half barrel, 19 States have provided by law or regulation for from two to four other packages, most of which are irregular sizes or not exact fractional parts of the standard barrel. These States include California, Idaho, Illinois, Kansas, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Virginia, and West Virginia. Fourteen States in this group have from one to seven of such packages by custom. Aside from the 140-pound sack, Michigan is the only State that has provided a complete list of packages down to the 6¼-pound sack that are even fractions of the standard 196-pound barrel.

In Iowa many sizes of packages are in use by custom. Besides the standard barrel and the 49-pound quarter-barrel sack prescribed by law, the reports received from different sections of this State indicate that 14 other packages were in use by custom, and that there were two different weights for the quarter, for the eighth, and for the sixteenth barrel sizes.

Texas is the only State in which the so-called decimal weights basis, i. e., 200-pound barrel, has been adopted. By a decision of the attorney general of the State, however, flour may be offered for sale in any size package when properly marked showing the net-weight contents.

Section 3. Packages used in the flour business.

The origin of the common unit of weight for the standard barrel of flour and the confusion resulting from the adoption of different sizes of packages for the smaller fractional parts of the barrel were explained before the House Committee on Coinage, Weights, and Measures, as follows: [1]

The accustomed barrel of flour of 196 pounds is by tradition only; that is, there has never been Federal action on it. A number of States—in fact, practically all of the States—have by statute made 196 pounds the legal barrel of flour. It comes down to us as 14 English stone of 14 pounds each. That was originally an old English 196 pounds of flour, which we accepted, and it has gone into commerce and has found a very important place.

The packages commonly used in the family trade are, first, the 98 pounds, or half-barrel; 49 pounds, or quarter-barrel; 24½ pounds, or one-eighth barrel; 12¼ pounds, or one-sixteenth barrel, the larger sizes of half-barrel and quarter-

[1] Statement by Mr. A. P. Husband, secretary Millers' National Federation, hearing, May 6, 1921, pp. 3, 4.

barrel being more popular in the country and suburban districts, while the smaller sizes are more popular in the cities. There are smaller sizes, as 10 pounds, 7 pounds, 5 pounds, 3 pounds, etc.; but attention is directed particularly to those fractions of a barrel around which has grown, we will say, abuses.

Beginning with the 49-pound sack, which is the true quarter of a barrel of 196 pounds, a number of States have legislated that in selling flour in quarter-barrel sacks they shall be 48 pounds, and that instead of 24½ pounds, which is the true division for the eighth, that they shall have 24 pounds, and instead of 12¼ pounds, a true one-sixteenth, that they shall be 12 pounds.

Now, the effect is that a man who goes to buy a barrel of flour buys 196 pounds. If he buys four quarters, in the States in which the statutes have been passed, he gets 192 pounds.

A list of the packages used in the flour-milling industry with the cost differentials adopted by the Millers' National Federation is shown in appendix Exhibit 1, page 127. This list provides for 21 different-sized packages in four kinds of containers. Two are for the 196-pound and 98-pound standard barrel and half-barrel in wood, 2 in 140-pound and 98-pound jute sacks, 19 ranging from 2-pound to 98-pound cotton sacks, and 15 in paper sacks which, with four exceptions, duplicate the sizes for the cotton sacks.

Mill sales are made on a basis of the 98-pound cotton sack, two to the barrel. A graduated list of differentials shows the cost per barrel over or under the 98-pound basis for sales in all other kinds and sizes of packages. For example, taking the list effective December 16, 1922,[2] bulk sales in 12¼-pound cotton sacks requiring 16 to the barrel would cost $0.60 per barrel over the base price. On the other hand, if the sale was for delivery in paper sacks of the same size the price would be $0.30 per barrel over the base price. Thus, if the price of a barrel of flour delivered in 98-pound cotton sacks was $9 a barrel, delivered in 12¼-pound cotton sacks it would be $9.60, whereas the same order filled in 12¼-pound paper sacks would cost $9.30 per barrel. The package differentials range as high as $1.60 per barrel for bulk sales in 2-pound paper sacks, shipped 96 to the barrel, while for the same size cotton sacks the maximum differential would be $2.70 per barrel.

To reflect the situation with respect to the packages used in actual operations the principal flour milling companies in different sections of the country were requested to furnish information showing the proportion of their sales in various packages during the year 1922. The reports show that in the general run of business about 20 different sizes of sacks were used. It may be noted, however, that in 1922, in the wide range of selling territory covered by some of the largest mills, it was necessary to carry four kinds of containers and about 40 different sizes of packages to supply their trade.

Confining the comparison to the packages most commonly in use, the following table shows for geographical districts the per cent of sales of flour in each size of package.

[2] Still in effect December, 1923.

TABLE 38.—*Per cent of flour-mill sales in different sizes of packages, by geographical districts, 1922*

Size of package	Geographical districts					
	Mountain and coast	North-western	South-western	South-eastern	Central and eastern	Average
200 pounds		0.1	1.3			0.4
196 pounds		.2	1.4	1.3	2.1	1.1
140 pounds	4.8	17.6	21.1	16.3	13.6	16.1
100 pounds	.1	.1	.1			.1
98 pounds	36.5	38.5	27.7	8.6	19.8	26.3
96 pounds				2.9	1.0	.7
49 pounds	23.2	27.8	1.6		10.4	10.9
48 pounds	18.3	1.3	26.2	15.7	4.4	14.0
24½ pounds	2.4	9.4	4.5		20.2	8.2
24 pounds	9.0	1.2	11.4	41.6	18.2	15.0
12½ pounds		.7	.2		1.3	.5
12 pounds	2.8	.9	1.9	11.5	5.4	4.0
10 pounds	.6	.1		.1	.2	.1
6 pounds			.5	1.2	.7	.5
5 pounds	.4	1.3	.5		1.7	.9
All other sizes	1.9	.8	1.6	.8	1.0	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

This table gives the results for 80 of the principal flour-milling companies reporting upon this subject, whose combined production in 1922 amounted to 30,342,293 barrels. This was equivalent to nearly one-fourth of the estimated total quantity of flour manufactured by all the merchant mills in the United States in that year.

Comparison of the figures shows that, while the sizes ranged all the way from a 200-pound sack down to a 2-pound package, the great bulk of sales was made in five or six popular sizes. Among other features shown by the table it will be noted that the sale of flour in the standard 196-pound wood barrel is insignificant, while sales in the 140-pound sacks are very large. The strong position of this size is due to the fact that it is used largely for bulk sales to the bakers trade east of the Rocky Mountains and also in the export business. The 98-pound sack predominates practically in all sections except in the Southeastern States where the 24-pound sack is by far the most popular size. More than 41 per cent of the mill sales in this section in 1922 was in the 24-pound sack. The strong showing of the 98-pound sack in the mountain and coast district is attributed to the fact that practically all sales to the bakers trade on the Pacific coast are in this size of sack.

In the 24 to 49-pound sacks, the mills in the mountain and coast, southeastern, and central and eastern districts report from 53 to about 57 per cent of the sales.

Mills in the northwest, southwest, and southeast divisions sold large quantities in the 140-pound size. In the quarter-barrel sizes the mills in the Southwest and Southeast favor the 48-pound sack as against the 49-pound size which is popular with the mills in the Northwest and Mountain and Coast States, although in the latter district also the 48-pound sack is noticeably strong.

The packages used by mills in the central and eastern district which extends from Illinois east to the seaboard may be said to represent the trade demands of a densely populated territory which is made up largely of the industrial, commercial, and business classes

of consumers. In this district also the apartment-house trade and the "cash and carry" chain-store system of distribution have encouraged the use of the smaller sizes of flour packages. It will be noted that a large proportion of the sales in this district were in the 24 and 24½-pound packages, and there was also a more general use of the smaller sizes.

A summary of the packages in the above table, showing their relation to the barrel and fractional parts of a barrel follows:

Weight of package	Approximate unit	Per cent
200 and 196 pounds	Barrel	1.5
140 pounds	Special	16.1
100, 98, and 96 pounds	Half barrel	27.1
49 and 48 pounds	Quarter barrel	24.9
24½ and 24 pounds	Eighth barrel	23.2
12½ and 12 pounds	Sixteenth barrel	4.5
6.5 pounds and under		2.7
Total		100.0

According to this statement, including the 140-pound sack, 97.3 per cent of the sales by the 80 mills in 1922 was packed in 12 different sizes of packages, which in fact represented only 5 regular package units and 1 special unit.

So far as the demand for particular sizes of flour packages in different sections of the country is concerned, further comparison of the data shows that in actual trade certain sizes are popular in one part of the country and other sizes in other sections. This situation is apparent from the following statement:

TABLE 39.—*Per cent of flour sales in specified sizes of packages, by districts*

Size of package	Mountain and coast	North-western	South-western	South-eastern	Central and eastern
140 pounds	4.8	17.6	21.1	16.3	13.6
98 pounds	36.5	38.5	27.7	8.6	19.8
49 pounds	23.2	27.8	1.6		10.4
48 pounds	18.3	1.3	26.2	15.7	4.4
24½ pounds	2.4	9.4	4.5		20.2
24 pounds	9.0	1.2	11.4	41.6	18.2
12 pounds	2.8	.9	1.9	11.5	5.4
7 sizes	97.0	96.7	94.4	93.7	92.0
Other sizes	3.0	3.3	5.6	6.3	8.0
Total	100.0	100.0	100.0	100.0	100.0

By the foregoing data it will be seen that in 1922 from 92 per cent to 97 per cent of the sales of the 80 mills reporting were packed in only seven different sizes of packages.

While the larger mills dispose of a considerable part of their flour in many States and therefore are obliged to use a wide assortment of packages, most milling companies distribute the bulk of their product in the States in which their mills are located and in neighboring States. The distribution of packages shown above reflects in general the package-weight requirements and customs of the States that are included in the different districts. (See Table 37, p. 87.)

Aside from the 140-pound sack, which meets special needs for bulk sales, storage, and export business by mills east of the Rocky Mountains, it is obvious that the entire list of flour packages might well be limited to a few standard sizes, each one of which should be so distinctly different in weight as to leave no room for mistake on the part of the dealer or purchaser; such standardization would result in more economical production and distribution for those engaged in the flour trade and ultimately in lower prices to the consumer.

The difficulties and abuses which are complained of by the milling industry are largely ascribed to the present duplicate classification for the quarter-barrel, eighth-barrel, and sixteenth-barrel sizes. As shown in the official package-differential list, page 127, there are two different sizes of packages for each of three fractional parts of the barrel. One set provides for 49, 24½, and 12¼ pound sacks, which are exact fractions of the standard 196-pound barrel, while another set has the 48, 24, and 12 pound sacks, which are factors of a 192-pound barrel. The proposed decimal-weight plan, which is strongly urged by the millers' associations, would eliminate all of these conflicting sizes and establish 100 pounds avoirdupois as the base unit, with 50, 25, 10, and 5 pound packages as the smaller sizes.

Section 4. Laws requiring the marking of weight on packages.

So far as reported to the commission, 41 States have made provision by law for marking the weight contents on flour packages or containers, while in 46 States there is a similar requirement for commercial feeding stuffs. With regard to flour packages, many of the State laws are patterned more or less closely after the package-weight provision in the misbranding section of the Federal food and drugs act of 1906, as amended March 3, 1913. The sections in the Federal law which apply to flour and other articles of food are as follows:

THE FOOD AND DRUGS ACT, JUNE 30, 1906, AMENDED AND APPROVED MARCH 3, 1913

AN ACT For preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes

* * * * * * *

SEC. 2. That the introduction into any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia, or from any foreign country, or shipment to any foreign country, of any article of food or drugs which is adulterated or misbranded within the meaning of this act is hereby prohibited.

* * * * * * *

SEC. 8. The term "misbranded" as used herein shall apply to all drugs, or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design, or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory, or country in which it is manufactured or produced.

That for the purpose of this act an article shall also be deemed to be misbranded: In the case of food:

* * * * * * *

Third, if in package form, the quantity of the contents be not plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count: *Provided, however,* That reasonable variations shall be permitted, and tolerances and also exemptions as to small packages shall be established by rules and regulations made in accordance with the provisions of section 3 of this act.

* * * * * * *

SEC. 6. * * * The term "food," as used herein, shall include all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound.

As stated in section 2, this act applies to interstate and foreign commerce and to the Territories and the District of Columbia. Under section 6 the term "food" applies also to commercial feeding stuffs that are intended for consumption by domestic animals.

Most of the State laws upon this subject are quite specific in that they provide that the "net," or "true net," or "correct," or "correct net," or "exact," or "correct and exact," or "actual" weight must be marked on each package. Preference, however, seems to be given to the term "net weight."

NET WEIGHT WHEN PACKED.—The term "net weight when packed" is frequently used on flour and feed packages and on packages containing other articles of food which are subject to shrinkage. Because of the variations in weight which may occur after packing and before shipment, a statement of "net weight when packed" is not necessarily a statement of the net weight when shipped. Therefore, under the Federal food and drugs act it is required that food in package form shall bear a statement of the quantity of the contents at the time it is offered for interstate shipment or otherwise comes within the jurisdiction of the act.[3] The Oregon law follows the Federal food and drugs act on this point. The terms net weight when packed or when wrapped are not permissible.

The main purpose of the Federal package-weight requirements is to safeguard the interests of the public in purchasing articles of food in original packages. It aims to prevent fraudulent dealing in short-weight packages of food shipped in interstate commerce. To make this law more effective, so that it will reach transactions of a local or purely intrastate character, most of the States have supplemented the Federal law and made its protective features in this regard applicable to all packages of food entering into commerce.

So far as flour and commercial feeding stuffs are concerned, aside from other provisions in the pure food and drugs laws and the special regulations applicable to feeding stuffs, the important requirement under the Federal or State laws, and in most instances under both laws, is that the weight contents of food packages or containers must be either marked, printed, stamped, branded, or otherwise indicated on the outside of each package.

The essential requirements of the different State laws are shown in the Appendix, Exhibit 2, page 128.

Section 5. Inadequacy of laws for marking the weight on packages.

The State pure food laws generally contain the important features of the Federal food and drugs act of 1906, as amended in 1913, and for all practical purposes the provision in the State laws requiring the marking of the weight contents on food packages is similar to that of the Federal law.

While there is no question that this particular provision has been of great benefit to the public in general, yet for certain classes of

[3] Service and regulatory announcements, No. 24, United States Department of Agriculture, Bureau of Chemistry.

consumers the protection intended by the marking requirement has not been fully attained.

In so far as the relief sought by the milling industry is concerned, the situation is not at all improved by the marking provision. In Texas the marking requirement rather tends to promote the multiplicity of packages, which is one of the principal grievances of the millers. Under the Texas weights and measures law of June 18, 1919, the standard of weight for a barrel of wheat flour was fixed at 200 pounds, the half-barrel sack 100 pounds, the quarter-barrel sack 50 pounds, and the eighth-barrel sack 25 pounds. No further provision was made for any other size of container or package for wheat flour. It appears, however, that under a decision by the attorney general of the State the sale of flour in any size of package is permitted provided the net weight contents are marked on each package. As a result of this decision, instead of having the decimal-weight packages, there are in use in Texas at the present time nine other sizes of flour packages that are not specified in the law of 1919.

The weight shown upon the package is a notice that it contains a certain quantity of flour, and with most purchasers this is all the protection necessary, for apparently there remains no opportunity for deception. Unfortunately, however, all purchasers do not understand the significance of the weight figures on flour packages. The number of this class of purchasers is, of course, unknown, but considering merely the illiterate, according to the census of 1920, there were 72,000,000 people 15 years of age and over in the United States, and of this number 4,686,000, or 6.5 per cent, were classed as illiterate. This part of the public is not protected by the requirements that the weight of the contents be plainly marked upon the package. Much buying is done through children to whom a weight mark means nothing.

Throughout the hearings on the several bills that have been before Congress, also in communications to this commission, reference was made to the deception and fraud practiced by unscrupulous retail dealers in selling flour to uninformed and nonobservant purchasers. The close resemblance between the 5 and 6 pound sack of flour, the 12 and 12¼ pound sizes, the 24 and 24½, or the 48 and 49 pound sacks affords ample opportunity for deceiving the uninformed or unsuspecting purchaser who does not look to see whether the weight stamped on the package offered is the weight expected in the package of similar size which he has previously bought.

A study of the data in Table 37, page 87, shows that 11 States have prescribed irregular packages below the half-barrel size, and in 7 other States a similar irregularity of packages has been established by custom. In none of these States, however, are there packages or sizes likely to result in confusion. On the other hand, there are 19 States having from 1 to 4 nearly similar packages in use at the present time. While 15 States of this latter group require that the weight must be indicated on each package, yet this provision alone affords no relief from the evil of multiplicity, nor does it give protection against mistakes or fraud.

Under the proposed decimal weight system the absurd and uneconomical complexity in the sizes of flour packages which exists at the present time would be avoided and the opportunities for deception would be reduced.

Section 6. Package weights for commercial feeding stuffs.

Reports received concerning the package requirements for commercial feeding stuffs were not as complete as in the case of flour packages. It was found that while in all States excepting Idaho and Montana the State laws and regulations require that the weight contents shall in some manner, either by labels or tags, be indicated on each package or container, yet only 18 States report having laws or regulations prescribing the weights of the different sizes of packages.

The object of the feed laws is to protect the purchaser from fraud and false representations by unscrupulous manufacturers and dealers. Therefore, in addition to the requirement that the weight contents must be marked on or affixed to each package, there are about 42 States in which the laws and regulations also require that each package shall give the name, brand, or trade-mark under which the feed is sold, the name and address of the manufacturer, the minimum percentage of crude protein and crude fat, and the maximum percentage of crude fiber. In 31 States the name of the ingredients in the feed must also be shown.

Table 40 gives a list of the feed-package weights reported for the different States.

TABLE 40.—*Package weights for commercial feeding stuffs prescribed by law or regulation or in use by trade custom in different States, 1922* [1]

[L=Prescribed by law; R=by regulation; C=in use by custom.]

State	Weight of package contents (pounds)										
	200	175	150	125	100	90	80	75	50	25	Other size sacks
Alabama	L	L	L	L	L			L	L	L	
Arkansas	L	L	L	L	L			L	L	L	10 and 5 lbs. L.
California							R				60 lbs. R.
Delaware					C						
Florida		R			R				R		
Georgia	L	L	L	L	L			L	L		
Idaho					C						
Illinois					C						
Indiana					L				L	L	
Iowa					C				C	C	
Kansas					L						
Kentucky	L		L		L				L		
Louisiana		L	L		L						
Maine					C						
Maryland					C						
Massachusetts					C						
Minnesota					C				C	C	
Mississippi	R		R		R			R	R	R	
Missouri					C				C	C	
Nebraska					L				L	L	
New Jersey					C						
New Mexico					C						
New York					C						
North Carolina	L	L	L	L	L			L	L	L	
Ohio					C						
Oklahoma					L						
Pennsylvania					C						
Rhode Island					C						
South Carolina	L	L	L	L	L			L	L	L	
South Dakota	L	L	L	L	L			L	L	L	
Tennessee	L	L	L	L	L			L	L	L	10 and 5 lbs. L.
Texas					L						
Utah					C	C	C				
Virginia	L	L	L	L	L			L	L	L	140 lbs. L.
Washington					C	C	C	C	C	C	
Wisconsin					C				C		
District of Columbia					C						

[1] The States of Arizona, Colorado, Connecticut, Michigan, Montana, Nevada, New Hampshire, North Dakota, Oregon, Vermont, West Virginia, and Wyoming do not regulate the weight of commercial feed packages, and the size of packages in use by custom was not reported.

It will be seen that, with a few exceptions, the weights ranging from the 5-pound package for poultry feed to the 200-pound sack are based upon the decimal system. States in the southeastern district particularly have a most complete arrangement of decimal weight packages.

The 80 and 90 pound sacks meet a special need in the Pacific Coast States and in Utah, while in all other States reporting the 100-pound sack is in general use either by law or by trade custom.

The 18 States having laws regulating the sizes of commercial feed packages include Alabama, Arkansas, California, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Nebraska, North Carolina, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, and Virginia.

Of the other 31 States and the District of Columbia, for which no laws regulating the sizes of commercial feed packages have been found, 19 reported the sizes most commonly in use by trade custom. The States in this group include, Delaware, Idaho, Illinois, Iowa, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, Utah, Washington, Wisconsin, and the District of Columbia. Montana has no regulations upon the subject. In Colorado the law requires that the weight, if stated, must be correct.

Section 7. The proposed uniform package law.

Primarily the agitation for uniform package laws was confined to wheat flour. More or less trouble was encountered in handling commercial feeding stuffs, but by far the greatest difficulty was found in meeting the requirements of custom weights and the different State laws regulating the smaller sizes of wheat-flour packages. Consequently, when the original bill was drafted for Congress there was no intention of having it apply to any commodity except wheat flour,[4] but discussion of the subject developed the need for a more comprehensive measure. As a result when the first bill aiming at standardization was finally introduced in the Sixty-fifth Congress, it provided for a standard of weights for flour, meal, and feeding stuffs. This bill was originally drafted at a conference between Mr. A. P. Husband secretary Millers' National Federation, and representatives of the United States Bureau of Standards and the Federal Trade Commission.[5]

This bill ignored the prevailing package weights entirely and substituted the decimal system. It specified that the standard should be 100 pounds avoirdupois, or multiples of 100 pounds, or fractions thereof, including 1, 2, 4, 5, 10, 25, and 50 pounds.[6] In effect, this plan would establish 200 pounds as the standard for a barrel of flour and at the same time eliminate all the irregular and inharmonious weights in use for packages below 100 pounds. Special provision was also made for packages used in the export trade.

Owing to the congested condition of the legislative calendar, this bill failed to pass. In the first session of the Sixty-sixth Congress a similar bill[7] passed the House in December, 1919, but failed of

[4] Hearings before House Committee on Coinage, Weights, and Measures, Sept. 19, 1919, part 2, p. 26.
[5] Hearings before Committee on Coinage, Weights, and Measures, Oct. 3, 1919, part 3, p. 76.
[6] H. R. 10957, Sixty-fifth Congress, first session.
[7] H. R. 7482, Sixty-sixth Congress, first session.

action by the Senate.[8] Again, in the first and fourth sessions of the Sixty-seventh Congress the bill was introduced, and while in each instance it received the unanimous approval of the House and was reported favorably without amendment in the Senate, the crowded condition of the legislative calendar again prevented final action by that body.[9]

The bill in its present form, with amendment, as reported to the House, March 14, 1924, by the Committee on Coinage, Weights, and Measures, is given in the Appendix, Exhibit 3, page 129.

A study of this bill shows that its chief purpose is to establish a simple and uniform standard of package weights which would answer every reasonable requirement of the flour trade and the public. The various sizes of packages are so clearly defined as to leave no room for the confusion that constantly arises under the present incongruous system of package weights. Section 2 of H. R. 3241, introduced December 13, 1923, reads as follows:

> That the standard packages for the following wheat-mill, rye-mill, and corn-mill products, namely, flours, hominy, grits, and meals, and all commercial feeding stuffs, when the same are packed, shipped, sold, or offered for sale in packages of five pounds or over, shall be those containing net avoirdupois, weight one hundred pounds, or multiples of one hundred pounds, or the following fractions thereof, five, ten, twenty-five, and fifty pounds; and in addition, for wheat flour, rye flour, and corn flour only, one hundred and forty pounds; and for commercial feeding stuffs only, sixty, seventy, and eighty pounds.

Although this bill was reported favorably, it failed to pass, apparently on account of the congested condition of the calendar.

The information received by this commission from milling companies, bag manufacturers, and others informed upon the subject all goes to show that the bill has practically the unqualified approval of all the factors engaged in the different branches of business that have to do with the production and sale of cereal mill products. Manufacturers of cereal specialties and wholesale grocers have expressed themselves with regard to the trade requirements in their particular lines of business, and individually and through their associations they have voiced their approval of the measure.[10]

Section 8. Unnecessary investment and package expense.

An argument urged in support of the proposed standardization of flour and feed packages is the waste of capital involved in carrying inventories of the large number of sizes of packages in use. It is said that the necessity of carrying stocks of numerous different sizes of packages requires a larger amount of capital than is warranted by the volume of business handled, and, furthermore, that this involves an additional expense in packing and shipping which adds to the cost of production.

The amount of capital necessary to carry stocks of packages adequate to meet trade demands depends upon the volume of business and the particular class of trade that is served. Obviously mills whose trade is confined to States in which the packages are regular and uniform in size are in much better position in this respect than those whose trade extends into various States where by law or

[8] Hearings, H. R. 4901, May 6, 1921, p. 6.
[9] H. R. 4901, Sixty-seventh Congress, first session, and H. R. 7103, Sixty-seventh Congress, fourth session.
[10] Hearings before Committee on Coinage, Weights, and Measures, H. R 7482, first session, Sixty-sixth Congress, and H R. 4901, first session, Sixty-seventh Congress

custom the package requirements include a full complement of regular and irregular sizes.

Comparison of reports for 25 flour milling companies that are equally distributed among the five geographical milling districts of the country shows that in the five years 1918–1922 the amounts invested in package inventories at the end of different business years for individual companies ranged from $10,000 to more than $2,000,000. Limiting the comparison to those having package inventories averaging less than $100,000 per year, 18 of the 25 companies show an average of $50,580, while for the other 7 companies that carried package stocks in excess of $100,000 per year the average amounted to $473,884.

Further comparison shows that among the smaller companies a greater proportion of the total inventory account was invested in packages. Thus, 14 of the 25 companies had a milling capacity in excess of 2,000 barrels per day. Their package account for the five years averaged 10.4 per cent of their total inventory investment. On the other hand, in the case of the other 11 companies whose milling capacity was less than 2,000 barrels per day their package investment during the five years averaged 18.2 per cent of the total inventory investment.

From this it would appear that in reducing the amount of capital necessary to carry stocks of packages the smaller companies would receive the greatest benefit.

The importance of package expense is indicated by the fact that for the 10-year period 1913–1922, excepting the cost of the wheat itself, packages constituted the largest single item in the cost of a barrel of flour (see Table 29, p. 67).

With respect to the expense incurred under the present package system and the advantage offered by standardization of flour packages, an official of a Kansas flour-milling company stated:

> We can not urge too strongly the adoption of a law to standardize the size of flour and feed packages. The present individual State laws and also general requirements of the trade pertaining to flour packages in particular make it necessary that we tie up an exorbitant sum of money in empty bags.
>
> If a law was adopted standardizing the sizes of these packages it would mean that we would only have to carry about 40 per cent of the bag stock that we are forced to have at the present time. All these additional expenses must, of course, be added to the selling price of flour, and as we are interested in getting out flour to the ultimate consumer at the lowest possible basis, we are naturally interested in any legislation that will eliminate certain unsatisfactory practices tending to elevate the cost of necessities.

Expressing approval of the decimal-weight bill, and also referring to the investment required to carry stocks of bags adequate to meet current demands, the president of another milling company in Kansas said: [11]

> We are unanimous in favoring the immediate passage of the above bill. The general public probably does not realize the very important part that bag costs represent in marketing wheat flour and corn-meal products. It is a conservative estimate the mills of even modest capacity are compelled to carry under present conditions probably 40 different-sized bags. This represents an investment of many thousand dollars.
>
> Should the bill become a law, a considerable saving to the consumer would undoubtedly result.

[11] Hearings before the House Committee on Coinage, Weights, and Measures, Part I, p. 19.

Regarding the investment necessary to handle the package situation, and the saving to the consumer by the proposed decimal-weight plan, a representative of the American Corn Millers' Federation stated: [12]

> I had an opportunity to go into that in detail with specific plants. In one plant I have in mind the monthly bag inventories before we suggested to the Food Administration to put us on a decimal basis approximated $100,000. It meant that much money was tied up every month. The consumer had to pay the interest on that and the profit on that, and it probably involved a storage space and equipment of a cost of $20,000 additional to the plant, as also several extra men, and altogether I believe to that one plant it will reduce the necessity for a charge to the consumer of $25,000 every year; rather, they could sell at $25,000 less for their products and have the same income as on the present basis.

As to the saving in the cost of packing wheat and corn products under the proposed standardization of packages, the general manager of one of the largest milling companies in the State of Texas said: [13]

> Aside from any selfish interests that we may have in the matter, we beg to call your attention to the fact that the standardization of packages for flour, meal, etc., will unquestionably result in a great saving in the cost of packing wheat and corn products, which correspondingly will result in a relative saving to the consumer. It seems to us this should be given due consideration at this particular time, when the attention of the entire country is concentrated on the all-important question of reducing the "high cost of living."

With regard to the efforts of the Millers' National Federation in behalf of the decimal weight bill and the wastefulness of the present package system, an official of one of the largest flour milling companies in Illinois wrote to the commission as follows:

> For the past few years the Millers' National Federation has tried to get Congress to pass a decimal weight bill which would, in our opinion, still further facilitate business. At the present time different States have different weight requirements, and the basic unit of a barrel, 196 pounds, is confusing. From an economical point of view the present system is wasteful and extravagant, as millers are required to carry in stock dozens of different-sized bags, ranging from 2 pounds to 280 pounds, whereas with the decimal weight bill many of the odd sizes would be eliminated. Furthermore, it would be to the advantage of the buyers, for at the present time a quarter barrel of flour in some States is 48 pounds, whereas in others it is 49 pounds.

Section 9. Attitude of bag manufacturers with respect to the proposed decimal weight system.

A change in the sizes of flour packages such as proposed by the decimal-weight plan also interests the bag and sack manufacturers. As a result of correspondence with bag manufacturers whose output constitutes fully 90 per cent of the total product for the country, it was found that the preponderance of sentiment was strongly in favor of the decimal-weight plan for flour and feed packages.

The following excerpts from statements submitted by representative bag manufacturers are of interest in this connection. On the general subject of standardizing flour and feed packages one manufacturer wrote to the commission:

> Any legislation that would tend to standardize weights for packages of flour and kindred products and feeds throughout the United States has our earnest support. At the present time there is considerable variation in the weights packed by mills for shipment into the different States. For instance, one-sixteenth barrel is packed 12 and 12½ pounds; one-eighth barrel is packed 24 and

[12] Hearings before the House Committee on Coinage, Weights, and Measures, Oct. 3, 1919, Part III, p. 67.
[13] Ibid., Part I, p. 16.

24½ pounds; one-fourth barrel is packed 48 and 49 pounds; one-half barrel is packed 96 and 98 pounds.

In some instances we have printed one-half barrel sacks—that is, on the same bag, "98 pounds, North Carolina"; "96 pounds, South Carolina"—so we assume the miller must pack this according to the State to which he intends shipping his product. There is absolutely no sensible reason why this should not be uniform throughout the United States. We believe that the decimal-weight system, namely, 100-pound unit, and fractional parts or multiples of this unit is the proper basis. As manufacturers of bags, and having considerable amount of electros made up with the old weight marks, it will cost us some money to make the desired changes in our engravings; but we are firmly of the opinion that this cost will be more than offset by the splendid results that a law of this kind properly enforced would accomplish.

Favoring standardization and pointing out certain advantages which would result from its adoption, the president of another company wrote the following:

Any action taken toward standardizing packages for flour would certainly meet our approval; this inasmuch as at the present time various States differ as to what constitutes the fractional amounts of a barrel. If decimal weights on basis of 200 pounds to the barrel could be used it would simplify the manufacture of packages and printing of same so that we would not be continually in hot water as to furnishing various mills with correct sized bags and correct printing of weights. Often a small error has proven quite expensive.

Expressing the belief that the decimal-weight plan would tend to economy and simplicity of operation, the president of a large bag company in the Middle West said:

With reference to the proposed standardization of the weight contents of packages, we are very much in favor of what was proposed in the bill H. R. 7103 before the last Congress and think that the adoption of this bill would tend to economy and simplicity of operation both for millers and for bag manufacturers.

The manager of one of the largest cotton-bag manufacturing companies in the country submitted the following statement:

Regarding the proposed Federal standardization of flour and feed packages, we wish to state that in our opinion this is a move in the right direction, as it is one which will undoubtedly benefit the flour miller as well as the bag manufacturers as follows:

The standardization of sizes, quality of material, and one class of package for the respective sizes which will put the product on a more competitive basis, and, likewise, prove economical to both the flour miller and bag manufacturer.

By the millers using one class of container for the respective size packages it will enable them to carry a smaller stock of bags inasmuch as it will then not necessitate their carrying bags of various dimensions. The bag manufacturer would likewise be benefited by his not being required to carry cloth of various weights and constructions.

Flour being a very competitive commodity, we know for a fact that some millers pay as high as $5 to $8 per thousand for a special class of bag as a container in order to help advertize and sell their product.

As a result of the commission's efforts to obtain the opinion of various bag manufacturers with regard to the proposed standardization of flour and feed packages, the matter was taken up by the Rope Paper Sack Manufacturers' Association. On May 29, 1923, the secretary of this association wrote the commission as follows:

Referring to your recent letter of May 15, I am pleased to advise you that this association went on record at its meeting of May 23 as being strongly in favor of the passage of a bill for standardizing flour and feed packages.

Section 10. Deception and fraud due to similar-sized packages.

With regard to the sale of flour in package form, while it is conceded that the size, shape, style, and general similarity in certain flour-package units below the half-barrel size makes them easily susceptible

of deception, and while the testimony of representatives of the milling industry indicate their belief that some of the retail dealers in various localties take unfair advantage of the indifference or ignorance of some classes of customers, yet no concrete evidence has been adduced in this connection by the millers.

Deception or fraud in the sale of flour appears to be most easily accomplished in States that permit a multiplicity of packages, and especially such packages as may be easily confused, such as 49 and 48 pound sacks, 24½ and 24 pound sacks, and 12¼ and 12 pound sacks.

Deception in the form which is here considered is a matter that naturally comes under the observation of officials whose duties bring them in contact with the methods of merchants who deal directly with the consumers. In the communications received by the commission, two State officials having supervision over the weights and measures laws have called attention to the use of flour packages that are not authorized by the State laws. Thus in Illinois it is pointed out that despite the fact the law specifies that the quarter-barrel sack of flour shall weigh 49 pounds and the eighth-barrel sack 24½ pounds, the grocers generally are selling flour in 48 and 24 pound sacks.

In West Virginia the law says that a barrel of flour shall contain 196 pounds and the legal one-eighth-barrel size is 24½ pounds, yet in many cases it has been found that eight 24-pound sacks have been delivered for a barrel, thus creating a shortage of 4 pounds to the barrel.

In the State of Iowa the law specifies that a sack of flour shall weigh 49 pounds, or one-fourth of a barrel. Yet an official in one of the mining districts in that State reports that—

The only way that flour is sold is by the sack and half sack. The sack weighs 48 pounds (called 50 pounds) and the half sack 24 pounds.

Replying to an inquiry regarding the size of packages in which retail dealers sell flour to the family trade, an official in another city in Iowa said:

They sell flour in 25, 50, and 100 pound sacks; also in any quantity that may be wanted less than 25 pounds.

The ease with which deception and fraud in the sale of flour in package form is made possible is forcibly illustrated by the experience of an official of the United States Food Administration during the years 1918 and 1919. In his official capacity as investigator for the Food Administration he had occasion to investigate the sales of flour and grain products and the sizes of packages in which flour was packed and sold. In relating his experience in St. Louis, Kansas City, and Minneapolis, he stated:

In a house-to-house canvass among the poorer classes not more than 1 housewife in 20 could tell what size package of flour she had purchased or was in the habit of purchasing. The answers were invariably that she had purchased a 25-cent sack of flour, a 40-cent sack of flour, a 60-cent sack of flour, or some similar designated price. When questioned as to the number of pounds she had purchased for 25 cents, 40 cents, or 60 cents, I found almost no one who could answer the question intelligently.

In the cases of the better classes, like families of locomotive engineers, foremen of industrial plants, foremen of laborers, etc., I found a small percentage who could readily distinguish between one-half barrels, one-fourth barrels, one-eighth barrels, one-sixteenth barrels, and the like. But the large majority

of housewives were found to be entirely ignorant concerning the fact that a standard barrel of flour contained 196 pounds, a half barrel 98 pounds, and a quarter barrel 49 pounds. They had "never examined a bag of flour to see how much it contained."

When questioned concerning odd-sized packages, such as 48 pounds, 24 pounds, 12 pounds, etc., the housewives answered that they did not know whether such sized packages were being sold, whether they had purchased odd-sized packages, or whether they had been getting proportionate parts of a standard barrel of 196 pounds.

My investigation also included retail stores where the storekeepers, almost without exception, said that they did not take any trouble to tell their customers or educate them in the size of the packages of flour being sold; that the number of pounds were plainly stamped upon the packages, and that this was sufficient notice to the public. When questioned concerning odd-sized packages, such as 48s for 49s, 24s for 24½s, etc., the answers were almost invariably that the dealer made no distinction between these sizes; both sold for the same price, but these same dealers admitted that they frequently made "a few cents more" on the barrel when they sold 48s and 24s, because they could buy these packages "a little cheaper."

The multiplicity of different packages, the lack of interest or intelligence in the subject, and the long-established trade customs and practices are exceedingly difficult to eradicate and, in my opinion, have led and are still leading to deceptive practices upon the part of retail merchants. During the year thousands of families are defrauded out of a few cents on each purchase of flour, and this in the long run amounts to thousands of dollars.

It is believed that standard-sized packages would do away with much of this deception and correct, to a very large extent, these fraudulent practices. Perhaps the most economical way would be to adopt a standard package of 100 pounds and provide that only exact multiples thereof could be used in interstate commerce. The decimal system is very much easier for an ignorant, uneducated person to calculate than the English system of weights and measures. Further, the majority of our ignorant population in the cities, especially at this time, are foreign born, but they are already familiar with the decimal system of weights and measures, that system having been used in the country of their nativity.

Numerous reasons could be advanced for adopting the decimal system of weights and measures and applying it uniformly in interstate commerce, but I know of no good reasons that can be advanced against the adoption and use of the decimal system except "custom and practice," which we should be all the more ready to discard for something better.

So far as deception and fraud in the sale of flour in the smaller sizes of packages is concerned, this statement reveals conditions that are believed to exist in many localities throughout the country.

Section 11. Policy of the United States Food Administration during the World War.

The importance of eliminating superfluous sizes of flour packages was recognized during the World War, when economy was sought in the production and distribution of all commodities. As in other branches of industry, the flour-milling companies—wholesalers, jobbers, and retailers—all felt the necessity of adjusting their operations to meet war-time requirements.

To facilitate the handling of flour and at the same time to keep the cost to the consumer as low as possible the United States Food Administration issued instructions to the flour millers of the country stating that after December 1, 1917:

As a part of the regulations governing milling, no flour mill operating under agreement with the United States Food Administrator shall, after December 1, 1917, sell flour in other than one-eighth, one-quarter, one-half barrel, or larger packages; and effective January 1, 1918, no mill shall ship flour in packages other than those described.

This plan was in effect about one month when the one-sixteenth barrel package was authorized, and later, on April 1, 1918, the

entire regulations on this subject were withdrawn. This course was deemed necessary because the Food Administration had issued "Substitution regulations," requiring purchasers of wheat flour to buy an equal quantity of flour substitutes, and, because the cancellation of the smaller sizes of flour packages interfered with the proper enforcement of the new regulations it was thought advisable to reinstate the customary commercial packages.[14]

The significant thing accomplished by the Food Administration was the elimination of more than 50 per cent of the different sizes of flour packages theretofore in use in the trade. Thus one large flour-milling concern reported a maximum of 65 different-sized packages used in a pre-war year, while it reported only17 different sizes for 1922.

[14] United States Food Administration, Milling Division, Circulars Nos. 9 and 12.

APPENDIX

APPENDIX TABLES

Table 1.—*Quantity and value of wheat flour exported from United States by countries, for the fiscal years ending June 30, 1919–1923, inclusive*

Countries	1919		1920	
	Barrels	Value	Barrels	Value
Belgium			1, 201, 191	$13, 157, 337
Denmark	160, 767	$1, 814, 153	18, 576	199, 697
France	3, 984, 365	42, 639, 971	2, 832, 952	30, 295, 214
Germany			278, 136	3, 071, 005
Greece	129, 841	1, 591, 944	155, 001	1, 844, 727
Italy	2, 393, 974	26, 216, 504	2, 484, 823	26, 988, 728
Netherlands	1, 117, 018	13, 269, 744	117, 224	1, 323, 859
Norway	185, 345	2, 178, 734	11, 428	118, 733
Poland and Danzig			2, 099, 438	22, 866, 804
United Kingdom	10, 896, 719	120, 749, 770	4, 743, 341	51, 814, 877
Other European	2, 909, 850	32, 440, 683	2, 176, 646	24, 484, 739
Canada	33, 701	341, 743	16, 313	179, 969
Central America	242, 215	2, 753, 700	476, 496	5, 545, 922
Mexico	384, 040	4, 354, 026	261, 054	2, 896, 573
Cuba	1, 058, 028	11, 652, 051	1, 598, 144	18, 791, 331
Haiti	138, 564	1, 655, 875	345, 808	4, 428, 768
Other West Indies	242, 187	2, 728, 193	579, 857	6, 538, 901
Brazil	31, 539	373, 956	381, 451	4, 738, 397
Venezuela	74, 535	866, 924	136, 276	1, 668, 379
British West Africa	23, 438	290, 154	95, 000	1, 333, 699
Hongkong	1, 506	15, 822	158, 180	1, 738, 957
Philippines	6, 039	65, 403	98, 659	1, 110, 741
Other countries	168, 208	1, 966, 919	1, 385, 967	15, 437, 313
Total	24, 181, 979	267, 966, 269	21, 651, 961	240, 574, 670

Countries	1921		1922		1923	
	Barrels	Value	Barrels	Value	Barrels	Value
Austria	523, 289	$5, 604, 482				
Belgium	565, 191	5, 717, 489	123, 479	$787, 765	42, 072	$227, 633
Denmark	87, 173	814, 481	359, 403	2, 480, 205	194, 899	1, 170, 991
Finland	295, 202	2, 673, 086	432, 881	2, 950, 745	299, 853	1, 785, 501
France	11, 385	87, 768				
Germany	1, 988, 070	17, 493, 847	1, 516, 353	8, 543, 188	1, 062, 684	5, 629, 680
Greece	419, 917	3, 918, 505	63, 810	373, 370	317, 738	1, 709, 938
Italy	315, 277	3, 288, 777	50, 058	303, 879	54, 280	275, 347
Netherlands	1, 263, 405	12, 021, 500	917, 560	5, 869, 782	982, 736	5, 253, 064
Norway	242, 134	2, 389, 858	408, 410	2, 574, 501	216, 555	1, 212, 066
Poland and Danzig	1, 034, 632	7, 179, 488	146, 744	879, 615	158, 785	829, 787
United Kingdom	3, 090, 158	26, 780, 208	3, 190, 762	20, 076, 205	1, 913, 833	10, 307, 948
Other European	1, 205, 658	11, 303, 373	2, 083, 106	11, 633, 937	1, 765, 786	9, 863, 599
Canada	35, 501	301, 174	68, 216	446, 313	66, 936	375, 264
Central America	426, 615	4, 316, 715	499, 827	3, 355, 762	537, 868	3, 344, 016
Mexico	359, 893	3, 514, 576	245, 670	1, 702, 529	365, 664	2, 214, 166
Cuba	986, 341	10, 528, 618	1, 068, 721	7, 585, 672	1, 088, 582	6, 762, 206
Haiti	210, 762	2, 618, 595	162, 488	1, 154, 711	281, 000	1, 846, 464
Other West Indies	593, 549	6, 298, 974	508, 775	3, 491, 571	473, 121	2, 849, 205
Brazil	622, 066	7, 859, 876	327, 018	2, 203, 076	477, 568	2, 910, 879
Venezuela	148, 855	1, 657, 580	77, 308	573, 195	83, 061	557, 333
British West Africa	55, 600	782, 283	65, 574	659, 362	108, 703	896, 090
Egypt	492, 873	5, 229, 176	190, 224	1, 236, 727	293, 147	1, 515, 321
Hongkong	142, 495	988, 990	973, 255	5, 224, 401	825, 197	4, 362, 791
Japan			629, 012	3, 372, 309	244, 560	1, 365, 281
China			573, 438	2, 985, 640	1, 860, 752	9, 772, 550
Philippines	197, 704	1, 870, 969	333, 046	2, 044, 789	469, 838	2, 803, 135
Other countries	866, 211	9, 274, 967	781, 686	4, 876, 882	697, 496	4, 150, 747
Total	16, 179, 956	154, 524, 355	15, 796, 824	97, 386, 131	14, 882, 714	83, 991, 002

TABLE 2.—*Comparison of the true and simple average rate of return by districts, and investment groups, 1919–1922*

Group and district	1919			1920			1921			1922			1919–1922	
	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	True average rate	Simple average rate
Under $250,000		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. c.*
Northwestern	7	25.8	22.8	5	2.5	2.3	6	[1] 0.6	[1] 2.0	6	15.0	12.4	11.7	9.8
Southwestern	8	14.4	13.5	8	[1] 0.9	[1] 5.0	8	[1] 10.5	[1] 13.8	8	0.4	[1] 2.6	1.6	[1] 2.0
Southeastern, central, and eastern	4	14.7	18.1	3	13.1	8.0	7	[1] 1.4	[1] 2.4	6	10.0	11.2	5.6	7.3
Mountain and coast	3	18.8	21.9	2	8.8	9.3	3	[1] 20.4	[1] 33.0	4	8.1	8.6	6.8	1.7
All districts	22	18.6	18.5	18	1.6	0.8	24	[1] 5.4	[1] 9.4	24	8.4	6.5	6.1	3.8
$250,000 to $500,000														
Northwestern	6	12.7	12.5	10	8.1	8.1	9	[1] 3.4	[1] 4.1	8	3.6	3.5	4.7	4.2
Southwestern	9	17.3	18.0	8	6.0	6.7	10	6.6	6.5	12	13.5	12.5	11.0	11.0
Southeastern, central, and eastern	7	16.1	18.1	8	15.2	16.7	5	[1] 3.8	[1] 3.7	5	8.6	10.2	10.0	11.7
Mountain and coast	4	10.2	9.8	4	12.2	12.2	6	[1] 1.7	[1] 4.5	3	16.9	16.9	7.4	6.6
All districts	26	14.8	15.5	30	9.9	10.6	30	0.1	[1] 0.7	28	10.2	10.0	8.4	9.1
$500,000 to $1,000,000														
Northwestern	3	21.0	19.0	1	12.6	12.6	1	[1] 3.2	[1] 3.2	2	6.8	7.4	11.7	11.6
Southwestern	12	14.1	19.2	13	22.2	21.4	16	2.1	1.7	13	12.4	12.6	13.2	12.6
Southeastern, central, and eastern	4	19.0	14.5	4	4.9	3.8	3	[1] 5.5	[1] 5.6	4	6.1	5.6	5.6	5.2
Mountain and coast	3	21.0	16.5	3	7.0	7.5	3	[1] 24.5	[1] 25.6	3	19.6	20.6	4.5	4.8
All districts	22	18.0	18.4	21	16.4	15.7	23	[1] 2.6	[1] 3.1	22	11.5	12.0	10.5	10.4

Group and district	1919			1920			1921			1922			1919–1922	
	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	Number of companies	True average rate	Simple average rate	True average rate	Simple average rate
$1,000,000 to $2,000,000		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*		*P. ct.*	*P. ct*	*P. ct.*	*P. ct.*
Northwestern	3	10.7	12.4	4	8.1	8.6	3	2.5	2.6	4	9.3	9.2	8.0	8.3
Southwestern	6	20.7	21.6	7	18.5	19.1	4	2.8	1.9	7	6.8	6.0	13.1	13.0
Southeastern, central, and eastern	5	13.0	13.7	5	10.5	9.7	5	[1] 4.7	[1] 4.7	2	6.1	3.5	6.7	5.8
Mountain and coast	----	----	----	2	19.2	18.9	----	----	----	----	----	----	19.2	19.0
All districts	14	15.5	16.8	18	13.7	14.1	12	[1] 0.4	[1] 0.7	13	7.1	5.9	10.0	9.8
$2,000,000 and over														
Northwestern	7	13.5	14.1	7	15.6	16.7	7	5.5	5.0	6	13.9	10.8	12.3	11.7
Southwestern	6	14.3	14.8	7	17.9	18.6	7	[1] 2.5	[1] 0.3	4	8.5	8.5	9.8	10.5
Southeastern, central, and eastern	2	11.0	12.2	2	3.5	1.3	2	7.3	10.2	2	12.4	23.2	8.4	11.7
Mountain and coast	2	11.2	10.8	2	19.6	17.2	2	[1] 2.3	[1] 4.0	2	7.5	7.8	9.7	7.9
All districts	17	12.9	13.7	18	15.5	15.8	18	2.8	2.0	14	11.6	11.5	11.0	10.8
All groups														
Northwestern	26	13.7	16.4	27	14.7	9.5	26	4.7	[1] 0.0	26	12.9	8.4	11.7	8.5
Southwestern	41	16.7	17.5	43	17.7	12.9	45	[1] 0.3	[1] 0.5	44	9.3	8.4	11.0	9.4
Southeastern, central, and eastern	22	12.4	16.4	22	6.5	10.2	22	1.7	[1] 2.5	19	9.8	9.7	7.7	8.4
Mountain and coast	12	11.9	14.7	13	18.2	12.5	14	[1] 4.6	[1] 15.0	22	9.0	13.6	9.3	5.7
All districts	101	13.9	16.7	105	14.9	11.4	107	1.6	[1] 2.7	101	10.9	9.3	10.6	8.5

[1] Loss.

TABLE 3.—*Rate of return on milling investment for individual companies, by years, 1919–1922*

1919	1920	1921	1922	1919	1920	1921	1922
Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
[1] 11.1	[1] 51.4	[1] 72.6	[1] 32.4				
[1] 2.0	[1] 15.3	[1] 64.2	[1] 12.6	15.9	11.8	[1] .0	8.9
.1	[1] 14.3	[1] 45.9	[1] 9.7	15.9	11.9	[1] .0	9.0
1.5	[1] 12.3	[1] 38.6	[1] 8.7	16.3	12.0	.0	9.1
4.7	[1] 10.6	[1] 32.2	[1] 8.3	16.5	12.6	.3	9.2
4.7	[1] 8.2	[1] 32.1	[1] 7.3	16.7	12.6	.3	9.3
4.9	[1] 7.9	[1] 31.6	[1] 5.7	16.8	13.0	.4	9.5
6.0	[1] 6.9	[1] 27.4	[1] 5.2	16.8	13.2	.4	9.6
6.6	[1] 4.8	[1] 23.6	[1] 2.9	17.2	13.3	1.4	9.6
6.8	[1] 4.7	[1] 21.5	[1] 2.2	17.3	15.0	1.5	9.6
7.0	[1] 4.1	[1] 19.6	[1] 1.8	17.7	15.7	1.5	9.7
7.0	[1] 4.0	[1] 18.3	[1] 1.4	17.8	15.9	2.0	9.9
7.1	[1] 3.9	[1] 17.9	[1] 1.0	17.8	16.1	2.1	10.1
7.2	[1] 2.5	[1] 17.3	[1] .9	18.1	16.6	2.6	10.4
7.2	[1] 2.4	[1] 16.2	[1] .8	18.7	17.1	2.8	10.5
7.6	[1] 2.0	[1] 15.3	[1] .2	18.8	17.2	2.9	10.7
7.6	[1] 1.8	[1] 15.2	[1] .0	----	17.3	3.3	----
7.9	[1] 1.5	[1] 14.8	.6	----	----	3.6	----
8.1	[1] 1.4	[1] 13.9	1.2	19.1	17.5	4.2	10.9
9.0	[1] 1.2	[1] 13.0	2.6	19.2	17.7	4.8	11.3
9.2	.6	[1] 12.9	2.9	19.4	17.9	4.8	11.4
9.5	.8	[1] 12.5	3.1	20.3	18.5	5.3	11.4
9.6	1.3	[1] 11.9	4.2	20.3	18.7	5.5	12.6
9.7	1.7	[1] 11.6	4.2	20.6	18.8	5.7	12.7
9.7	2.4	[1] 10.7	4.5	20.6	18.9	5.8	13.0
9.8	2.5	[1] 9.8	4.5	20.8	18.9	6.3	13.0
9.9	2.6	[1] 9.5	5.0	20.9	19.4	6.3	13.1
10.3	2.9	[1] 8.5	5.2	21.0	20.9	6.5	13.3
10.5	3.5	[1] 7.5	5.5	21.4	21.2	7.1	13.6
11.0	3.7	[1] 7.1	5.7	22.6	21.4	7.1	14.0
11.5	3.7	[1] 7.1	6.0	22.7	22.1	7.8	14.5
11.6	4.0	[1] 6.7	6.2	22.9	22.3	7.9	15.7
11.6	5.1	[1] 6.3	6.3	23.6	22.9	8.6	15.7
11.7	5.6	[1] 6.2	6.4	23.8	23.0	9.0	16.8
----	5.8	[1] 6.0	----	24.4	24.5	9.8	17.3
----	----	[1] 5.4	----	24.6	24.6	10.0	18.4
11.7	6.4	[1] 5.3	6.5	24.8	25.5	10.0	19.0
11.8	6.5	[1] 5.2	6.5	25.9	25.9	10.4	19.1
11.9	6.7	[1] 5.2	6.6	26.4	26.5	11.1	19.6
12.1	7.0	[1] 5.1	6.7	27.6	27.0	11.3	19.6
12.3	7.2	[1] 4.9	7.2	27.8	27.2	11.5	21.6
12.4	7.4	[1] 4.6	7.2	30.6	27.8	12.6	21.7
12.7	7.9	[1] 4.1	7.4	30.7	28.4	13.4	22.2
12.7	8.3	[1] 3.7	7.5	34.1	29.0	14.5	24.6
12.8	8.7	[1] 3.2	7.6	34.3	29.1	15.2	28.2
13.0	8.8	[1] 2.0	7.9	36.2	29.8	16.3	30.7
13.6	9.7	[1] 2.0	8.0	37.9	31.1	16.6	32.4
14.1	10.0	[1] 1.7	8.1	45.2	34.2	19.2	39.9
14.2	10.4	[1] .8	8.2	45.5	36.6	21.0	40.7
14.2	11.1	[1] .7	8.2	50.0	36.7	21.2	44.5
14.5	11.2	[1] .5	8.2	50.5	37.0	26.3	47.3
14.7	11.4	[1] .5	8.4	----	38.2	27.7	----
14.9	11.4	[1] .4	8.4	----	49.2	44.1	----
15.5	11.6	[1] .2	8.7				
15.8	11.7	[1] .0	8.8	[2] 13.9	[2] 14.9	[2] 1.6	[2] 10.9

[1] Loss. [2] Average.

TABLE 4.—*Rate of return on investment by 108 merchant flour-milling companies for 4 years, 1919–1922*

Company No.	Group No.	Rate of return	Company No.	Group No.	Rate of return	Company No.	Group No.	Rate of return
		Per cent			*Per cent*			*Per cent*
1	1	[1] 10.6	37	2	5.2	73	1	11.5
2	1	[1] 10.0	38	3	5.5	74	4	11.6
3	2	[1] 9.0	39	5	5.6	75	3	11.7
4	3	[1] 7.8	40	2	5.6	76	4	12.3
5	1	[1] 6.5	41	4	6.0	77	5	12.4
6	1	[1] 6.0	42	2	6.5	78	3	12.5
7	2	[1] 5.9	43	5	6.6	79	3	12.6
8	1	[1] 5.3	44	2	6.9	80	5	12.9
9	2	[1] 5.3	45	2	7.2	81	2	13.0
10	2	[1] 3.2	46	5	7.3	82	5	13.2
11	1	[1] 2.5	47	5	7.8	83	3	13.5
12	4	[1] 1.8	48	1	7.9	84	3	14.1
13	1	[1] 1.7	49	1	8.0	85	3	14.2
14	3	[1] 1.2	50	2	8.1	86	2	14.5
15	2	.4	51	4	8.2	87	5	14.9
16	1	.6	52	2	8.4	88	5	15.4
17	2	1.8	53	4	8.4	89	3	15.4
18	1	1.8	54	5	8.6	90	5	15.9
19	2	2.1	55	2	8.8	91	2	16.2
20	3	2.2	56	3	9.0	92	3	17.4
21	1	2.3	57	5	9.1	93	4	18.3
22	1	2.5	58	1	9.9	94	5	18.3
23	1	2.6	59	2	10.0	95	1	18.3
24	2	3.1	60	4	10.0	96	3	18.8
25	1	3.2	61	1	10.0	97	2	19.1
26	2	3.3	62	4	10.3	98	3	19.5
27	2	3.3	63	3	10.4	99	4	19.7
28	4	3.4	64	4	10.4	100	3	19.9
29	3	3.9	65	2	10.5	101	1	20.9
30	2	4.2	66	2	11.0	102	2	21.2
31	3	4.3	67	4	11.0	103	1	22.5
32	5	4.3	68	2	11.0	104	3	26.0
33	4	4.5	69	5	11.2	105	1	26.5
34	2	4.5	70	3	11.4	106	2	29.4
35	3	4.6	71	5	11.4	107	3	32.0
36	5	5.1	72	3	11.5	108	2	40.0

[1] Loss.

TABLE 5.—*Cost of sales, operating profit, milling profit, and company profit by districts, 1919–1922*

Year and district	Flour sold (barrels)	Total mill cost	Purchased flour and inventory variations	Selling expense	Cost of flour sold
1919					
Northwestern district	28,114,822	$286,678,099	[2] $2,656,819	$8,132,579	$292,153,859
Southwestern district	11,725,576	108,911,096	3,700,756	1,791,744	114,403,596
Southeastern district	2,617,245	26,894,172	158,728	452,906	27,505,806
Central and eastern districts	3,453,646	35,623,746	[2] 193,664	759,517	36,189,599
Mountain and coast districts	4,145,719	39,614,808	[2] 257,323	358,028	39,715,513
Total	50,057,008	497,721,921	751,678	11,494,774	509,968,373
1920					
Northwestern district	27,833,152	317,096,847	[2] 2,467,455	11,246,748	325,876,140
Southwestern district	13,147,047	134,035,312	4,122,702	3,000,496	141,158,510
Southeastern district	2,114,797	23,598,846	192,424	518,508	24,309,778
Central and eastern districts	3,287,527	36,424,159	574,171	1,078,768	38,077,098
Mountain and coast districts	5,203,194	50,813,768	468,507	581,875	51,864,150
Total	51,585,717	561,968,932	2,890,349	16,426,395	581,285,676
1921					
Northwestern district	26,658,015	222,196,110	8,540,941	12,672,172	243,409,223
Southwestern district	11,977,245	96,993,402	3,279,218	3,398,736	103,671,356
Southeastern district	1,940,242	15,274,777	402,123	480,327	16,157,227
Central and eastern districts	2,905,939	24,997,548	785,747	956,510	26,739,805
Mountain and coast districts	3,579,971	30,291,975	1,367,334	693,595	32,352,904
Total	47,061,412	389,753,812	14,375,363	18,201,340	422,330,515
1922					
Northwestern district	28,041,263	171,821,663	2,459,318	11,180,316	185,461,297
Southwestern district	13,667,130	72,837,362	1,579,187	3,458,101	77,874,650
Southeastern district	2,156,370	13,342,773	70,767	573,355	13,986,895
Central and eastern districts	2,533,030	16,878,495	263,685	830,312	17,972,492
Mountain and coast districts	4,448,269	24,509,464	529,586	667,401	25,706,451
Total	50,846,062	299,389,757	4,902,543	16,709,485	321,001,785
1919–1922					
Northwestern district	110,647,252	997,792,719	5,875,985	43,231,815	1,046,900,519
Southwestern district	50,516,998	412,777,172	12,681,863	11,649,077	437,108,112
Southeastern district	8,828,654	79,110,568	824,042	2,025,096	81,959,706
Central and eastern districts	12,180,142	113,923,948	1,429,939	3,625,107	118,978,994
Mountain and coast districts	17,377,153	145,230,015	2,108,104	2,300,899	149,639,018
Total	199,550,199	1,748,834,422	22,919,933	62,831,994	1,834,586,349

[2] Loss.

TABLE 5.—*Cost of sales, operating profit, milling profit, and company profit by districts, 1919–1922*—Continued

Year and district	Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Total company profit
1919						
Northwestern district	$302,081,349	$9,927,490	$359,561	$10,287,051	$1,226,345	$9,060,706
Southwestern district	120,260,880	5,857,284	800,778	6,658,062	836,560	5,821,502
Southeastern district	29,060,257	1,554,451	[2] 176,809	1,377,642	340,194	1,037,448
Central and eastern districts	38,091,108	1,901,509	176,692	2,078,201	490,009	1,588,192
Mountain and coast districts	41,566,830	1,851,317	1,097,837	2,949,154	554,275	2,394,879
Total	531,060,424	21,092,051	2,258,059	23,350,110	3,447,383	19,902,727
1920						
Northwestern district	337,304,223	11, 28,083	2,024,541	13,452,624	2,701,682	10,750,942
Southwestern district	148,995,801	7,837,291	1,493,716	9,331,007	1,209,791	8,121,216
Southeastern district	24,735,938	426,160	[2] 115,934	310,226	304,160	6,066
Central and eastern districts	39,381,500	1,304,402	216,382	1,520,784	513,676	1,007,108
Mountain and coast districts	54,589,188	2,725,038	2,802,874	5,527,912	515,391	5,012,521
Total	605,006,650	23,720,974	6,421,579	30,142,553	5,244,700	24,897,853
1921						
Northwestern district	248,870,257	5,461,034	[2] 2,052,341	3,408,693	1,067,826	2,340,867
Southwestern district	103,818,350	146,994	[2] 276,616	[2] 129,622	868,058	[2] 997,680
Southeastern district	15,998,041	[2] 159,186	105,262	[2] 53,924	171,814	[2] 225,738
Central and eastern districts	27,199,504	459,699	[2] 12,486	447,213	337,301	109,912
Mountain and coast districts	31,289,355	[2] 1,063,549	[2] 21,210	[2] 1,084,759	322,025	[2] 1,406,784
Total	427,175,507	4,844,992	[2] 2,257,391	2,587,601	2,767,024	[2] 179,423
1922						
Northwestern district	193,174,677	7,713,380	572,329	8,285,709	33,708	8,252,001
Southwestern district	81,791,449	3,916,799	[2] 101,125	3,815,674	541,630	3,274,044
Southeastern dstrict	14,875,533	888,638	220,984	1,109,622	121,311	988,311
Central and eastern districts	18,741,432	768,940	52,318	821,258	272,484	548,774
Mountain and coast districts	26,264,253	557,802	1,512,577	2,070,379	391,503	1,678,876
Total	334,847,344	13,845,559	2,257,083	16,102,642	1,360,636	14,742,006
1919–1922						
Northwestern district	1,081,430,506	34,529,987	904,090	35,434,077	5,029,561	30,404,516
Southwestern district	454,866,480	17,758,368	1,916,753	19,675,121	3,456,039	16,219,082
Southeastern district	84,669,769	2,710,063	33,503	2,743,566	937,479	1,806,087
Central and eastern districts	123,413,544	4,434,550	432,906	4,867,456	1,613,470	3,253,986
Mountain and coast districts	153,709,626	4,070,608	5,392,078	9,462,686	1,783,194	7,679,492
Total	1,898,089,925	63,503,576	8,679,330	72,182,906	12,819,743	59,363,163

[1] Less interest paid, plus income from outside investment.

[2] Loss.

TABLE 6.—*Wheat ground, flour produced, and cost of milling (including packages), by districts, 1919–1922*

Year and district	Number of mills	Daily capacity (barrels)	Bushels of wheat ground	Barrels of flour produced	Wheat cost [1]	Labor	General expense
1919							
Northwestern district	60	128,500	112,165,900	24,403,100	$257,810,955	$5,165,993	$3,963,507
Southwestern district	57	72,450	50,378,711	11,324,023	111,299,546	2,392,735	2,704,221
Southeastern district	11	17,450	11,364,806	2,604,413	28,012,147	601,504	769,300
Central and eastern districts	15	42,524	30,700,337	6,962,050	73,164,290	1,495,179	1,260,481
Mountain and coast districts	37	26,999	18,433,826	4,169,491	38,799,935	1,286,506	857,036
Total	180	287,923	223,263,580	49,963,077	509,086,873	10,941,917	9,574,545
1920							
Northwestern district	55	150,300	115,242,536	24,335,033	297,827,285	6,591,827	5,224,210
Southwestern district	59	75,700	57,809,745	12,711,371	138,651,871	3,269,418	3,580,498
Southeastern district	11	17,450	9,507,734	2,091,928	24,507,431	624,563	815,265
Central and eastern districts	15	42,524	31,684,286	6,908,012	80,146,339	2,082,342	1,650,259
Mountain and coast districts	38	27,399	22,689,839	5,138,508	50,811,410	1,930,883	1,024,712
Total	178	313,373	236,934,140	51,184,852	591,944,336	14,499,033	12,294,944
1921							
Northwestern district	61	129,850	103,191,464	22,169,615	186,359,710	5,865,584	4,512,440
Southwestern district	67	81,200	52,661,292	11,639,090	94,374,027	3,058,963	3,817,992
Southeastern district	11	17,450	8,688,534	1,920,538	15,025,733	493,497	699,672
Central and eastern districts	15	42,524	31,002,078	6,975,540	60,483,279	1,611,737	1,648,069
Mountain and coast districts	39	27,599	15,647,323	3,529,424	28,931,287	1,584,275	946,821
Total	193	298,623	211,190,691	46,234,207	385,174,036	12,614,056	11,624,994
1922							
Northwestern district	61	129,850	104,216,108	22,556,809	139,368,662	4,918,512	4,465,815
Southwestern district	68	80,800	60,901,351	13,399,818	70,650,954	2,785,986	3,644,122
Southeastern district	11	17,450	9,888,881	2,150,898	13,309,964	495,948	700,159
Central and eastern districts	12	39,924	34,650,741	7,646,016	47,368,255	1,264,281	1,543,827
Mountain and coast districts	37	26,609	19,361,451	4,394,764	22,290,542	1,471,494	816,972
Total	189	294,723	229,018,532	50,148,305	292,988,377	10,936,221	11,170,895
1919–1922							
Northwestern district	------	------	434,816,008	93,964,557	881,366,612	22,541,916	18,185,972
Southwestern district	------	------	221,751,099	49,074,302	414,976,398	11,507,102	13,746,833
Southeastern district	------	------	39,669,955	8,767,777	80,855,275	2,215,512	2,984,396
Central and eastern districts	------	------	128,037,442	28,491,618	261,162,163	6,453,539	6,102,636
Mountain and coast districts	------	------	76,132,439	17,232,187	140,833,174	6,273,158	3,645,541
Total	------	------	900,406,943	197,530,441	1,779,193,622	48,991,227	44,665,378

[1] Includes options and self-rising ingredients.

TABLE 6.—*Wheat ground, flour produced, and cost of milling (including packages), by districts, 1919–1922*—Continued

Year and district	Depreciation	Packages	Other mill costs	Gross mill costs	Feed credit	Net mill costs
1919						
Northwestern district	$450, 715	$11, 672, 963	$4, 290, 466	$283, 374, 599	$32, 341, 531	$251, 033, 068
Southwestern district	426, 603	5, 376, 056	2, 174, 786	124, 373, 947	15, 462, 851	108, 911, 096
Southeastern district	149, 727	1, 428, 221	427, 280	31, 388, 179	4, 494, 007	26, 894, 172
Central and eastern districts	119, 807	3, 712, 658	870, 416	80, 622, 831	9, 354, 054	71, 268, 777
Mountain and coast districts	227, 590	1, 971, 489	911, 905	44, 054, 461	4, 439, 653	39, 614, 808
Total	1, 374, 442	24, 161, 387	8, 674, 853	563, 814, 017	66, 092, 096	497, 721, 921
1920						
Northwestern district	428, 583	12, 043, 908	4, 932, 777	327, 048, 590	50, 062, 998	276, 985, 592
Southwestern district	583, 199	6, 286, 677	2, 646, 423	155, 018, 086	20, 982, 774	134, 035, 312
Southeastern district	134, 587	1, 543, 708	450, 419	28, 075, 973	4, 477, 127	23, 598, 846
Central and eastern districts	113, 669	3, 815, 405	1, 014, 546	88, 822, 560	12, 287, 146	76, 535, 414
Mountain and coast districts	248, 864	2, 599, 024	1, 112, 829	57, 727, 722	6, 913, 954	50, 813, 768
Total	1, 508, 902	26, 288, 722	10, 156, 994	656, 692, 931	94, 723, 999	561, 968, 932
1921						
Northwestern district	564, 612	7, 329, 739	4, 743, 984	209, 376, 069	23, 085, 165	186, 290, 904
Southwestern district	640, 935	4, 967, 414	2, 519, 838	109, 379, 169	12, 385, 767	96, 993, 402
Southeastern district	167, 558	827, 327	348, 055	17, 561, 842	2, 287, 065	15, 274, 777
Central and eastern districts	152, 284	2, 421, 325	977, 496	67, 294, 190	6, 391, 436	60, 902, 754
Mountain and coast districts	240, 008	1, 592, 202	802, 789	34, 097, 382	3, 805, 407	30, 291, 975
Total	1, 765, 397	17, 138, 007	9, 392, 162	437, 708, 652	47, 954, 840	389, 753, 812
1922						
Northwestern district	586, 520	5, 543, 693	4, 247, 906	159, 131, 108	17, 932, 066	141, 199, 042
Southwestern district	682, 493	3, 007, 913	2, 423, 850	83, 195, 318	10, 357, 956	72, 837, 362
Southeastern district	185, 335	793, 798	319, 857	15, 805, 061	2, 462, 288	13, 342, 773
Central and eastern districts	137, 511	2, 006, 442	902, 258	53, 222, 574	5, 721, 458	47, 501, 116
Mountain and coast districts	243, 440	1, 497, 902	846, 535	27, 166, 885	2, 657, 421	24, 509, 464
Total	1, 835, 299	12, 849, 748	8, 740, 406	338, 520, 946	39, 131, 189	299, 389, 757
1919–1922						
Northwestern district	2, 030, 430	36, 590, 303	18, 215, 133	978, 930, 366	123, 421, 760	855, 508, 606
Southwestern district	2, 333, 230	19, 638, 060	9, 764, 897	471, 966, 520	59, 189, 348	412, 777, 172
Southeastern district	637, 207	4, 593, 054	1, 545, 611	92, 831, 055	13, 720, 487	79, 110, 568
Central and eastern districts	523, 271	11, 955, 830	3, 764, 716	289, 962, 155	33, 754, 094	256, 208, 061
Mountain and coast districts	959, 902	7, 660, 617	3, 674, 058	163, 046, 450	17, 816, 435	145, 230, 015
Total	6, 484, 040	80, 437, 864	36, 964, 415	1, 996, 736, 546	247, 902, 124	1, 748, 834, 422

TABLE 7.—*Net cost of manufacturing flour per barrel, by companies, arranged from low to high, 1919–1921* [1]

1919						1920						1921					
Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel	Company No.	Cost per barrel
1	$8.67	37	$9.75	73	$10.29	1	$8.61	37	$10.58	73	$11.51	1	$4.90	37	$7.51	73	$9.02
2	9.03	38	9.78	74	10.30	2	9.19	38	10.69	74	11.51	2	6.03	38	7.56	74	9.09
3	9.05	39	9.79	75	10.31	3	9.34	39	10.72	75	11.52	3	6.07	39	7.57	75	9.13
4	9.08	40	9.80	76	10.32	4	9.37	40	10.73	76	11.54	4	6.08	40	7.71	76	9.13
5	9.09	41	9.83	77	10.34	5	9.44	41	10.78	77	11.54	5	6.13	41	7.76	77	9.17
6	9.14	42	9.87	78	10.35	6	9.47	42	10.78	78	11.55	6	6.15	42	7.95	78	9.21
7	9.16	43	9.88	79	10.35	7	9.73	43	10.81	79	11.57	7	6.30	43	7.96	79	9.28
8	9.25	44	9.89	80	10.36	8	9.77	44	10.87	80	11.66	8	6.36	44	8.02	80	9.30
9	9.28	45	9.92	81	10.38	9	9.79	45	10.87	81	11.66	9	6.42	45	8.11	81	9.35
10	9.29	46	9.93	82	10.40	10	9.84	46	10.89	82	11.68	10	6.44	46	8.17	82	9.44
11	9.33	47	9.96	83	10.40	11	9.86	47	10.91	83	11.69	11	6.48	47	8.20	83	9.45
12	9.34	48	9.96	84	10.47	12	9.89	48	10.93	84	11.76	12	6.51	48	8.22	84	9.45
13	9.34	49	9.96	85	10.51	13	9.92	49	10.93	85	11.80	13	6.66	49	8.31	85	9.47
14	9.35	50	9.97	86	10.52	14	9.94	50	11.02	86	11.82	14	6.66	50	8.34	86	9.51
15	9.37	51	9.97	87	10.55	15	9.95	51	11.06	87	11.93	15	6.69	51	8.35	87	9.61
16	9.40	52	9.98	88	10.56	16	9.96	52	11.07	88	11.93	16	6.77	52	8.45	88	9.67
17	9.41	53	9.98	89	10.69	17	9.97	53	11.09	89	11.97	17	6.81	53	8.47	89	9.71
18	9.46	54	9.99	90	10.72	18	10.02	54	11.15	90	11.98	18	6.83	54	8.51	90	9.76
19	9.46	55	10.00	91	10.74	19	10.05	55	11.17	91	12.07	19	6.88	55	8.55	91	9.80
20	9.49	56	10.04	92	10.75	20	10.05	56	11.20	92	12.18	20	6.96	56	8.57	92	9.83
21	9.54	57	10.06	93	10.81	21	10.10	57	11.22	93	12.22	21	7.01	57	8.61	93	10.04
22	9.55	58	10.07	94	10.88	22	10.11	58	11.25	94	12.23	22	7.03	58	8.62	94	10.07
23	9.55	59	10.08	95	10.95	23	10.12	59	11.30	95	12.25	23	7.03	59	8.65	95	10.24
24	9.56	60	10.09	96	11.02	24	10.23	60	11.31	96	12.27	24	7.04	60	8.68	96	10.37
25	9.56	61	10.11	97	11.03	25	10.25	61	11.31	97	12.30	25	7.05	61	8.70	97	10.44
26	9.57	62	10.12	98	11.08	26	10.26	62	11.32	98	12.32	26	7.07	62	8.71	98	10.52
27	9.61	63	10.13	99	11.17	27	10.27	63	11.35	99	12.34	27	7.08	63	8.73	99	10.76
28	9.62	64	10.13	100	11.23	28	10.31	64	11.36	100	12.45	28	7.12	64	8.73	100	10.82
29	9.62	65	10.15	101	11.42	29	10.32	65	11.36	101	12.65	29	7.17	65	8.75	101	10.86
30	9.63	66	10.15	----	-------	30	10.33	66	11.39	102	12.72	30	7.21	66	8.83	102	10.98
31	9.65	67	10.16	----	-------	31	10.37	67	11.41	103	12.73	31	7.23	67	8.89	103	11.08
32	9.71	68	10.17	----	-------	32	10.37	68	11.43	104	12.76	32	7.37	68	8.91	104	11.26
33	9.72	69	10.18	----	-------	33	10.39	69	11.45	105	13.99	33	7.43	69	8.94	105	11.27
34	9.72	70	10.19	----	-------	34	10.43	70	11.47	----	-------	34	7.44	70	8.94	106	11.38
35	9.73	71	10.22	----	-------	35	10.48	71	11.47	----	-------	35	7.46	71	8.95	107	11.69
36	9.73	72	10.27	----	-------	36	10.53	72	11.49	----	-------	36	7.48	72	8.95	----	-------

[1] See Appendix Table 8 for details of cost for 1922

TABLE 8.—*Manufacturing cost per barrel, of wheat flour for 102 companies,*[1] *arranged in the order of net mill costs, from low to high, 1922*

Company No.	Wheat	Labor	General expense	Depreciation	Packages	Other mill costs	Gross mill costs	Feed credit	Net mill costs
1	$5.00	$0.22	$0.11	$0.04	$0.08	$0.14	$5.64	$0.72	$4.87
2	4.86	.20	.22	.04	.15	.16	5.63	.69	4.94
3	5.15	.17	.23	.02	.19	.13	5.89	.92	4.97
4	5.09	.18	.15	.08	.24	.16	5.90	.91	4.99
5	4.87	.17	.21	.07	.20	.15	5.67	.67	5.00
6	4.82	.11	.21	.12	.20	.25	5.71	.68	5.03
7	5.05	.21	.24	.05	.23	.05	5.83	.77	5.06
8	5.18	.33	.15	----------	.13	.09	5.88	.82	5.06
9	4.79	.23	.33	.06	.28	.18	5.87	.81	5.06
10	4.73	.20	.15	.05	.18	.14	5.45	.37	5.08
11	5.25	.23	.26	.06	.11	.15	6.06	.96	5.10
12	4.96	.22	.21	.07	.19	.17	5.82	.71	5.11
13	4.97	.20	.11	.05	.37	.07	5.77	.64	5.13
14	5.26	.15	.15	.04	.17	.12	5.89	.75	5.14
15	4.88	.26	.21	.06	.24	.16	5.81	.66	5.15
16	4.85	.19	.27	.03	.39	.23	5.96	.74	5.22
17	4.84	.25	.20	----------	.36	.59	6.24	1.02	5.22
18	4.91	.21	.32	.04	.19	.09	5.76	.53	5.23
19	5.43	.26	.27	.06	.32	.14	6.48	1.19	5.29
20	5.17	.21	.21	.04	.28	.13	6.04	.74	5.30
21	5.02	.21	.28	----------	.14	.12	5.77	.45	5.32
22	5.04	.19	.26	.05	.15	.22	5.91	.58	5.33

[1] Two widely separated mills of one company were treated as separate campanies.

TABLE 8.—*Manufacturing cost per barrel, of wheat flour for 102 companies, arranged in the order of net mill costs, from low to high, 1922*—Continued

Company No.	Wheat	Labor	General expense	Depreciation	Packages	Other mill costs	Gross mill costs	Feed credit	Net mill costs
23	$5.05	$0.25	$0.16	$0.04	$0.33	$0.22	$6.05	$0.72	$5.33
24	5.17	.19	.16	.03	.28	.33	6.16	.80	5.36
25	5.27	.34	.21	.10	.18	.19	6.29	.92	5.37
26	5.01	.21	.35	.11	.26	.20	6.14	.73	5.41
27	5.06	.16	.16	.04	.20	.38	6.00	.58	5.42
28	5.14	.32	.23	.12	.31	.17	6.29	.86	5.43
29	4.97	.22	.40	----------	.30	.22	6.11	.68	5.43
30	4.81	.36	.36	.13	.26	.17	6.09	.65	5.44
31	5.37	.17	.17	.09	.20	.13	6.13	.67	5.46
32	5.00	.35	.33	----------	.25	.17	6.10	.63	5.47
33	5.52	.20	.25	.03	.15	.16	6.31	.83	5.48
34	5.39	.26	.29	.07	.46	.13	6.60	1.08	5.52
35	5.49	.20	.16	----------	.22	.23	6.30	.76	5.54
36	5.43	.12	.11	.06	.24	.29	6.25	.70	5.55
37	4.84	.18	.44	.08	.24	.39	6.17	.61	5.56
38	5.60	.31	.28	.09	.20	.15	6.63	1.02	5.61
39	4.40	.48	.80	.09	.20	.24	6.21	.56	5.65
40	4.95	.44	.12	.06	.36	.20	6.13	.47	5.66
41	5.33	.25	.20	----------	.32	.22	6.32	.63	5.69
42	5.80	.25	.29	.03	.30	.10	6.77	1.05	5.72
43	5.32	.20	.29	.03	.34	.27	6.45	.72	5.73
44	5.70	.19	.14	.05	.23	.12	6.43	.69	5.74
45	5.70	.21	.28	.06	.34	.20	6.79	1.04	5.75
46	5.93	.18	.17	.10	.26	.20	6.84	1.08	5.76
47	5.38	.34	.34	.04	.24	.13	6.47	.71	5.76
48	5.59	.25	.40	.06	.29	.22	6.81	1.03	5.78
49	5.50	.27	.24	.03	.48	.15	6.67	.83	5.84
50	5.82	.17	.18	.02	.24	.14	6.57	.73	5.84
51	5.65	.31	.20	.11	.33	.36	6.96	1.09	5.87
52	5.58	.36	.26	----------	.22	.14	6.56	.69	5.87
53	5.26	.36	.23	.05	.40	.27	6.57	.69	5.88
54	6.05	.12	.14	.01	.25	.10	6.67	.72	5.95
55	6.07	.21	.16	.10	.23	.15	6.92	.97	5.95
56	6.14	.15	.15	.02	.17	.14	6.77	.81	5.96
57	6.30	.19	.23	.08	.28	.15	7.23	1.26	5.97
58	5.56	.35	.41	.10	.27	.16	6.85	.88	5.97
59	5.64	.42	.47	.04	.34	.19	7.10	1.13	5.97
60	5.93	.11	.20	.07	.25	.24	6.80	.77	6.03
61	5.70	.40	.16	.08	.26	.20	6.80	.72	6.08
62	5.20	.19	.56	.09	.26	.46	6.76	.67	6.09
63	6.39	.28	.32	.12	.33	.21	7.65	1.55	6.10
64	5.87	.33	.09	----------	.20	.27	6.76	.66	6.10
65	5.42	.12	1.09	.06	.15	.15	6.99	.86	6.13
66	5.94	.26	.22	.16	.33	.14	7.05	.90	6.15
67	6.04	.18	.19	.11	.23	.15	6.90	.75	6.15
68	6.15	.22	.12	.08	.16	.15	6.88	.72	6.16
69	6.13	.28	.24	.04	.20	.20	7.09	.92	6.17
70	6.16	.11	.14	.05	.19	.35	7.00	.82	6.18
71	6.17	.34	.40	.11	.27	.06	7.35	1.16	6.19
72	5.94	.29	.30	----------	.22	.29	7.04	.83	6.21
73	5.26	.49	.44	.12	.48	.27	7.06	.82	6.24
74	6.32	.22	.13	.01	.23	.19	7.10	.86	6.24
75	6.00	.35	.22	----------	.25	.16	6.98	.72	6.26
76	6.25	.13	.19	.07	.26	.17	7.07	.73	6.34
77	5.84	.37	.51	.12	.28	.19	7.31	.92	6.39
78	5.78	.28	.52	.08	.41	.24	7.31	.89	6.42
79	6.15	.26	.24	.05	.23	.25	7.18	.75	6.43
80	6.49	.22	.16	.05	.25	.10	7.27	.83	6.44
81	6.07	.23	.61	.08	.33	.16	7.48	1.03	6.45
82	5.89	.35	.48	.09	.42	.12	7.35	.86	6.49
83	6.40	.17	.40	.08	.19	.07	7.31	.81	6.50
84	6.48	.25	.19	.03	.27	.18	7.40	.88	6.52
85	6.70	.16	.21	.03	.19	.12	7.41	.85	6.56
86	6.64	.18	.22	.03	.24	.08	7.39	.82	6.57
87	6.59	.16	.46	.08	.37	.16	7.82	1.23	6.59
88	5.97	.47	.63	----------	.58	.09	7.74	1.10	6.64
89	6.75	.19	.21	.03	.25	.10	7.53	.88	6.65
90	5.50	.51	1.09	----------	.25	.25	7.60	.86	6.74
91	6.60	.22	.17	.05	.27	.15	7.46	.70	6.76
92	6.16	.33	.32	.04	.29	.26	7.40	.58	6.82
93	6.05	.49	.54	----------	.22	.38	7.68	.85	6.83
94	6.18	.32	.72	.16	.15	.34	7.87	.96	6.91
95	6.75	.29	.38	.10	.34	.05	7.91	.95	6.96
96	6.91	.18	.33	.05	.26	.33	8.06	1.08	6.98
97	6.76	.19	.33	.04	.35	.15	7.82	.82	7.00
98	7.28	.23	.33	.11	.39	.22	8.56	1.31	7.25
99	6.78	.18	.60	.17	.35	.16	8.24	.76	7.48
100	7.51	.28	.55	.03	.19	.14	8.70	1.10	7.60
101	7.65	.29	.38	.09	.23	.03	8.67	.96	7.71
102	7.23	.20	.60	.09	.48	.18	8.78	.66	8.12

TABLE 9.—*Company investment, income, and rate of return for 28 identical flour-milling companies, 1913–1922*

Year and group	Investment	Income	Rate of return
			Per cent
1913			
Northwestern	$22,882,616	$4,374,181	19.1
Southwestern	4,884,226	171,170	3.5
Eastern	4,774,166	363,527	7.6
Total	32,541,008	4,908,878	15.1
1914			
Northwestern	23,599,349	5,166,878	21.9
Southwestern	5,063,625	856,477	16.9
Eastern	4,950,803	500,498	10.1
Total	33,613,777	6,523,853	19.4
1915			
Northwestern	25,506,747	5,638,324	22.1
Southwestern	5,729,323	1,432,844	25.0
Eastern	5,403,504	759,183	14.0
Total	36,639,574	7,830,351	21.4
1916			
Northwestern	28,516,427	7,185,081	25.2
Southwestern	6,495,970	977,826	15.1
Eastern	5,948,584	691,630	11.6
Total	40,960,981	8,854,537	21.6
1917			
Northwestern	34,394,433	14,504,991	42.2
Southwestern	8,427,680	4,004,953	47.5
Eastern	6,808,726	1,446,082	21.2
Total	49,630,839	19,956,026	40.2
1918			
Northwestern	40,223,959	11,318,277	28.1
Southwestern	11,059,535	3,793,079	34.3
Eastern	8,133,343	1,989,310	24.5
Total	59,416,837	17,100,666	28.8
1919			
Northwestern	41,855,739	8,011,014	19.1
Southwestern	14,071,191	2,917,194	20.7
Eastern	9,411,613	1,456,169	15.5
Total	65,338,543	12,384,377	19.0
1920			
Northwestern	43,898,343	10,341,588	23.6
Southwestern	15,997,832	4,121,203	25.8
Eastern	9,694,535	511,644	5.3
Total	69,590,710	14,974,435	21.5
1921			
Northwestern	43,971,623	2,335,769	5.3
Southwestern	16,414,892	[1] 293,327	[1] 1.8
Eastern	9,533,821	194,320	2.0
Total	69,920,336	2,236,762	3.2
1922			
Northwestern	44,651,546	7,684,424	17.2
Southwestern	16,809,696	1,650,093	9.8
Eastern	9,622,923	1,138,842	11.8
Total	71,084,165	10,473,359	14.7
1913–1922			
Northwestern	349,500,784	76,560,530	21.9
Southwestern	104,953,970	19,631,510	18.7
Eastern	74,282,018	9,051,205	12.2
Total	528,736,772	105,243,245	19.9

[1] Loss.

TABLE 10.—*Cost of sales, operating profit, milling profit, and company profit, by districts, for 28 identical companies, 1913–1922*

Year and group	Flour sold	Total mill cost	Purchased flour and inventory variations	Selling expense	Cost of flour sold	Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Total company profit
	Barrels										
1913											
Northwestern	26, 562, 782	$96, 537, 189	[2] $396, 055	$5, 309, 579	$101, 450, 713	$106, 213, 538	$4, 762, 825	[2] $806, 549	$3, 956, 276	$417, 905	$4, 374, 181
Southwestern	4, 444, 766	17, 140, 562	54, 164	598, 656	17, 793, 382	18, 102, 775	309, 393	[2] 123, 661	185, 732	[2] 14, 562	171, 170
Eastern	3, 188, 554	13, 722, 221	627, 893	533, 338	14, 883, 452	15, 618, 960	735, 508	[2] 231, 896	503, 612	[2] 140, 085	363, 527
Total	34, 196, 102	127, 399, 972	286, 002	6, 441, 573	134, 127, 547	139, 935, 273	5, 807, 726	[2] 1, 162, 106	4, 645, 620	263, 258	4, 908, 878
1914											
Northwestern	26, 219, 912	94, 501, 035	[2] 398, 693	5, 829, 187	99, 931, 529	105, 638, 658	5, 707, 129	[2] 779, 180	4, 927, 949	238, 929	5, 166, 878
Southwestern	4, 516, 037	15, 296, 188	1, 064, 973	586, 490	16, 947, 651	18, 006, 071	1, 058, 420	[2] 176, 571	881, 849	[2] 25, 372	856, 477
Eastern	3, 635, 692	14, 800, 544	153, 735	706, 995	15, 661, 274	16, 812, 740	1, 151, 466	[2] 416, 556	734, 910	[2] 234, 412	500, 498
Total	34, 371, 641	124, 597, 767	820, 015	7, 122, 672	132, 540, 454	140, 457, 469	7, 917, 015	[2] 1, 372, 307	6, 544, 708	[2] 20, 855	6, 523, 853
1915											
Northwestern	24, 021, 582	126, 264, 241	1, 786, 555	6, 013, 034	134, 063, 830	139, 647, 987	5, 584, 157	[2] 296, 025	5, 288, 132	350, 192	5, 638, 324
Southwestern	5, 302, 121	24, 363, 204	280, 028	715, 688	25, 358, 920	26, 622, 376	1, 263, 456	198, 452	1, 461, 908	[2] 29, 063	1, 432, 845
Eastern	4, 427, 426	22, 867, 634	735, 410	721, 327	24, 324, 371	25, 313, 736	989, 365	[2] 12, 598	976, 767	[2] 217, 584	759, 183
Total	33, 751, 129	173, 495, 079	2, 801, 993	7, 450, 049	183, 747, 121	191, 584, 099	7, 836, 978	[2] 110, 171	7, 726, 807	103, 545	7, 830, 352
1916											
Northwestern	28, 929, 735	136, 926, 960	[2] 4, 988, 171	6, 867, 575	138, 806, 364	147, 093, 777	8, 287, 413	[2] 1, 223, 609	7, 063, 804	121, 277	7, 185, 081
Southwestern	5, 554, 956	25, 720, 463	170, 692	789, 696	26, 680, 851	27, 837, 264	1, 156, 413	[2] 147, 721	1, 008, 692	[2] 30, 867	977, 825
Eastern	4, 381, 844	22, 724, 397	335, 657	820, 366	23, 880, 420	24, 871, 442	991, 022	[2] 151, 002	840, 020	[2] 148, 390	691, 630
Total	38, 866, 535	185, 371, 820	[2] 4, 481, 822	8, 477, 637	189, 367, 635	199, 802, 483	10, 434, 848	[2] 1, 522, 332	8, 912, 516	[2] 57, 980	8, 854, 536
1917											
Northwestern	24, 601, 035	194, 027, 532	1, 568, 891	7, 568, 681	203, 165, 104	217, 938, 988	14, 773, 884	[2] 525, 721	14, 248, 163	256, 829	14, 504, 992
Southwestern	5, 834, 158	41, 266, 762	118, 866	1, 026, 282	42, 411, 910	45, 633, 542	3, 221, 632	775, 162	3, 996, 794	8, 159	4, 004, 953
Eastern	3, 834, 347	29, 222, 581	890, 398	889, 989	31, 002, 968	32, 656, 583	1, 653, 615	[2] 14, 337	1, 639, 278	[2] 193, 196	1, 446, 082
Total	34, 269, 540	264, 516, 875	2, 578, 155	9, 484, 952	276, 579, 982	296, 229, 113	19, 649, 131	235, 104	19, 884, 235	71, 792	19, 956, 027
1918											
Northwestern	22, 114, 409	206, 197, 818	1, 061, 061	5, 623, 721	212, 882, 600	222, 555, 157	9, 672, 557	1, 452, 304	11, 124, 861	193, 416	11, 318, 277
Southwestern	5, 187, 849	46, 693, 491	3, 409, 028	790, 143	50, 892, 662	53, 928, 514	3, 035, 852	711, 583	3, 747, 435	45, 644	3, 793, 079
Eastern	3, 578, 756	34, 179, 842	1, 539, 398	603, 542	36, 322, 782	38, 292, 930	1, 970, 148	197, 481	2, 167, 629	[2] 178, 319	1, 989, 310
Total	30, 881, 014	287, 071, 151	6, 009, 487	7, 017, 406	300, 098, 044	314, 776, 601	14, 678, 557	2, 361, 368	17, 039, 925	60, 741	17, 100, 666

Year and group	Flour sold	Total mill cost	Purchased flour and inventory variations	Selling expense	Cost of flour sold	Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Total company profit
1919											
Northwestern	23, 967, 029	244, 295, 265	[2] 3, 048, 569	7, 225, 159	248, 471, 855	257, 291, 949	8, 820, 094	[2] 1, 368, 692	7, 451, 402	559, 612	8, 011, 014
Southwestern	6, 797, 992	60, 473, 762	3, 358, 600	1, 079, 741	64, 912, 103	68, 113, 613	3, 201, 510	[2] 312, 653	2, 888, 857	28, 337	2, 917, 194
Eastern	3, 730, 209	38, 863, 857	[2] 361, 957	885, 032	39, 386, 932	41, 506, 498	2, 119, 566	[2] 483, 710	1, 635, 856	[2] 179, 687	1, 456, 169
Total	34, 495, 230	343, 632, 884	[2] 51, 926	9, 189, 932	352, 770, 890	366, 912, 060	14, 141, 170	[2] 2, 165, 055	11, 976, 115	408, 262	12, 384, 377
1920											
Northwestern	24, 498, 039	278, 989, 246	[2] 3, 111, 362	10, 185, 591	286, 063, 475	297, 535, 534	11, 472, 059	[2] 1, 175, 886	10, 296, 173	45, 415	10, 341, 588
Southwestern	6, 992, 202	68, 574, 173	3, 096, 971	1, 590, 394	73, 261, 538	77, 481, 141	4, 219, 603	[2] 154, 974	4, 064, 629	56, 574	4, 121, 203
Eastern	3, 391, 766	37, 667, 031	321, 321	1, 205, 360	39, 193, 712	40, 295, 868	1, 102, 156	[2] 395, 062	707, 094	[2] 195, 450	511, 644
Total	34, 882, 007	385, 230, 450	306, 930	12, 981, 345	398, 518, 725	415, 312, 543	16, 793, 818	[2] 1, 725, 922	15, 067, 896	[2] 93, 461	14, 974, 435
1921											
Northwestern	23, 135, 151	195, 119, 097	7, 646, 721	11, 495, 755	214, 261, 573	218, 898, 460	4, 636, 887	[2] 2, 713, 224	1, 923, 663	412, 106	2, 335, 769
Southwestern	6, 360, 251	49, 465, 002	2, 196, 212	1, 781, 784	53, 442, 998	54, 087, 848	644, 850	[2] 1, 038, 507	[2] 393, 657	100, 330	[2] 293, 327
Eastern	3, 105, 582	25, 814, 262	665, 544	1, 077, 653	27, 557, 459	28, 093, 950	536, 491	[2] 186, 726	349, 765	[2] 155, 445	194, 320
Total	32, 600, 984	270, 398, 361	10, 508, 477	14, 355, 192	295, 262, 030	301, 080, 258	5, 818, 228	[2] 3, 938, 457	1, 879, 771	356, 991	2, 236, 762
1922											
Northwestern	24, 304, 941	149, 014, 318	2, 091, 327	9, 864, 966	160, 970, 611	168, 196, 360	7, 225, 749	[2] 193, 561	7, 032, 188	652, 237	7, 684, 425
Southwestern	7, 263, 193	36, 877, 907	1, 354, 096	1, 792, 988	40, 024, 991	42, 123, 066	2, 098, 075	[2] 477, 395	1, 620, 680	29, 412	1, 650, 092
Eastern	3, 284, 053	21, 170, 565	20, 617	1, 099, 149	22, 290, 331	23, 536, 957	1, 246, 626	84, 896	1, 331, 522	[2] 192, 680	1, 138, 842
Total	34, 852, 187	207, 062, 790	3, 466, 040	12, 757, 103	223, 285, 933	233, 856, 383	10, 570, 450	[2] 586, 060	9, 984, 390	488, 969	10, 473, 359
10 YEARS											
Northwestern (10)	248, 354, 615	1, 721, 872, 701	2, 211, 705	75, 983, 248	1, 800, 067, 654	1, 881, 010, 408	80, 942, 754	[2] 7, 630, 143	73, 312, 611	3, 247, 918	76, 560, 529
Southwestern (12)	58, 253, 525	385, 871, 514	15, 103, 630	10, 751, 862	411, 727, 006	431, 936, 210	20, 209, 204	[2] 746, 285	19, 462, 919	168, 592	19, 631, 511
Eastern (6)	36, 558, 229	261, 032, 934	4, 928, 016	8, 542, 751	274, 503, 701	286, 999, 664	12, 495, 963	[2] 1, 609, 510	10, 886, 453	[2] 1, 835, 248	9, 051, 205
Total	343, 166, 369	2, 368, 777, 149	22, 243, 351	95, 277, 861	2, 486, 298, 361	2, 599, 946, 282	113, 647, 921	[2] 9, 985, 938	103, 661, 983	1, 581, 262	105, 243, 245

[1] Less interest paid plus income from outside investment.

[2] Loss.

TABLE 11.—*Cost of sales, value of sales, operating profit, milling profit, and company profit per barrel, for 28 identical companies, by districts, 1913–1922*

District	Cost of flour sold			Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Company profit
	Cost of sales	Selling expense	Total						
1913									
Northwestern	$3.62	$0.20	$3.82	$4.00	$0.18	[2] $0.03	$0.15	[3] $0.01	$0.16
Southwestern	3.87	.13	4.00	4.07	.07	[2] .03	.04	-------	.04
Eastern	4.49	.18	4.67	4.90	.23	[2] .07	.16	.05	.11
Total	3.73	.19	3.92	4.09	.17	[2] .03	.14	-------	.14
1914									
Northwestern	3.59	.22	3.81	4.03	.22	[2] .03	.19	[2] .01	.20
Southwestern	3.62	.13	3.75	3.99	.24	[2] .04	.20	.01	.19
Eastern	4.12	.19	4.31	4.63	.32	[2] .12	.20	.06	.14
Total	3.65	.21	3.86	4.09	.23	[2] .04	.19	-------	.19
1915									
Northwestern	5.33	.25	5.58	5.81	.23	[2] .01	.22	[2] .01	.23
Southwestern	4.65	.13	4.78	5.02	.24	.04	.28	.01	.27
Eastern	5.34	.16	5.50	5.72	.22	-------	.22	.05	.17
Total	5.22	.22	5.44	5.67	.23	-------	.23	-------	.23
1916									
Northwestern	4.56	.24	4.80	5.09	.29	[2] .04	.25	-------	.25
Southwestern	4.66	.14	4.80	5.01	.21	[2] .03	.18	-------	.18
Eastern	5.26	.19	5.45	5.68	.23	[2] .04	.19	.03	.16
Total	4.65	.22	4.87	5.14	.27	[2] .04	.23	-------	.23
1917									
Northwestern	7.95	.31	8.26	8.86	.60	[2] .02	.58	[2] .01	.59
Southwestern	7.09	.18	7.27	7.82	.55	.13	.68	-------	.68
Eastern	7.86	.23	8.09	8.52	.43	-------	.43	.05	.38
Total	7.79	.28	8.07	8.64	.57	.01	.58	-------	.58
1918									
Northwestern	9.37	.25	9.62	10.06	.44	.06	.50	[2] .01	.51
Southwestern	9.66	.15	9.81	10.39	.58	.14	.72	[2] .01	.73
Eastern	9.98	.17	10.15	10.70	.55	.06	.61	.05	.56
Total	9.49	.23	9.72	10.19	.47	.08	.55	-------	.55
1919									
Northwestern	10.07	.30	10.37	10.74	.37	[2] .06	.31	[2] .02	.33
Southwestern	9.39	.16	9.55	10.02	.47	[2] .05	.42	[2] .01	.43
Eastern	10.32	.24	10.56	11.13	.57	[2] .13	.44	.05	.39
Total	9.96	.27	10.23	10.64	.41	[2] .06	.35	[2] .01	.36
1920									
Northwestern	11.26	.42	11.68	12.15	.47	[2] .05	.42	-------	.42
Southwestern	10.25	.23	10.48	11.08	.60	[2] .02	.58	[2] .01	.59
Eastern	11.20	.36	11.56	11.88	.32	[2] .11	.21	.06	.15
Total	11.05	.37	11.42	11.90	.48	[2] .05	.43	-------	.43
1921									
Northwestern	8.76	.50	9.26	9.46	.20	[2] .12	.08	[2] .02	.10
Southwestern	8.12	.28	8.40	8.50	.10	[2] .16	[2] .06	[2] .01	[2] .05
Eastern	8.52	.35	8.87	9.04	.17	[2] .06	.11	.05	.06
Total	8.62	.44	9.06	9.24	.18	[2] .12	.06	[2] .01	.07

[1] Less interest paid plus income from outside investments.
[2] Loss.
[3] Gain.

TABLE 11.—*Cost of sales, value of sales, operating profit, milling profit, and company profit per barrel, for 28 identical companies, by districts, 1913–1922*—Continued

District	Cost of flour sold			Value of flour sold	Operating profit	Other gains or losses	Milling profit	Less interest paid [1]	Company profit
	Cost of sales	Selling expense	Total						
1922									
Northwestern	6.21	.41	6.62	6.92	.30	[2] .01	.29	[2] .03	.32
Southwestern	5.26	.25	5.51	5.80	.29	[2] .07	.22	[2] .01	.23
Eastern	6.46	.33	6.79	7.17	.38	.03	.41	.06	.35
Total	6.04	.37	6.41	6.71	.30	[2] .02	.28	[2] .02	.30
1913–1922									
Northwestern	6.93	.31	7.24	7.57	.33	[2] .03	.30	[2] .01	.31
Southwestern	6.89	.18	7.07	7.41	.34	[2] .01	.33	[2] .01	.34
Eastern	7.28	.23	7.51	7.85	.34	[2] .04	.30	.05	.25
Total	6.97	.28	7.25	7.58	.33	[2] .03	.30	[2] .01	.31

[2] Loss.

Table 12.—*Annual mill cost per barrel of wheat flour for 28 identical companies, by districts, 1913–1922*

Year and group	Number of companies	Number of mills	Daily capacity (barrels)	Wheat ground (bushels)	Flour produced (barrels)	Wheat cost [1]		Labor		General expense	
						Amount	Per barrel	Amount	Per barrel	Amount	Per barrel
1913											
Northwestern	10	42	125,700	113,646,281	25,712,508	$99,230,893	$3.86	$2,352,348	$0.09	$1,693,221	$0.07
Southwestern	12	21	30,300	19,985,438	4,433,075	17,850,707	4.02	441,714	.10	394,302	.09
Eastern	6	8	22,500	13,725,936	3,063,584	13,988,900	4.57	435,345	.14	539,983	.18
Total	28	71	178,500	147,357,655	33,209,167	131,070,500	3.95	3,329,407	.10	2,627,506	.08
1914											
Northwestern	10	42	125,700	114,543,275	26,111,317	99,562,011	3.81	2,608,718	.10	1,820,689	.07
Southwestern	12	21	30,300	19,022,501	4,209,865	16,271,860	3.87	456,693	.11	428,459	.10
Eastern	6	9	24,700	15,946,796	3,573,775	15,263,167	4.27	502,809	.14	663,995	.19
Total	28	72	180,700	149,512,572	33,894,957	131,097,038	3.87	3,568,220	.11	2,913,143	.09
1915											
Northwestern	10	42	125,700	107,023,758	23,744,990	133,730,817	5.63	2,485,649	.10	1,921,677	.08
Southwestern	12	21	30,300	23,616,686	5,232,123	25,914,681	4.95	524,786	.10	517,246	.10
Eastern	6	9	24,700	19,307,332	4,281,983	23,925,899	5.59	524,147	.12	714,728	.16
Total	28	72	180,700	149,947,776	33,259,096	183,571,397	5.52	3,534,582	.11	3,153,651	.10
1916											
Northwestern	10	42	125,700	132,897,598	29,409,073	143,658,163	4.88	2,950,682	.10	2,033,018	.07
Southwestern	12	21	30,300	25,302,154	5,510,043	27,294,299	4.95	561,215	.10	525,926	.10
Eastern	6	9	24,700	19,636,122	4,286,350	23,519,079	5.49	544,819	.13	784,266	.18
Total	28	72	180,700	177,835,874	39,205,466	194,471,541	4.96	4,056,716	.10	3,343,210	.09
1917											
Northwestern	10	42	125,700	111,258,934	24,059,033	208,493,796	8.67	3,242,321	.13	2,677,206	.11
Southwestern	12	21	30,300	26,114,025	5,761,831	44,114,937	7.66	641,207	.11	710,354	.12
Eastern	6	9	24,700	16,614,329	3,682,785	30,701,975	8.33	578,206	.16	850,360	.23
Total	28	72	180,700	153,987,288	33,503,649	283,310,708	8.46	4,461,734	.13	4,237,920	.13
1918											
Northwestern	10	42	125,700	96,645,222	21,972,553	212,056,711	9.65	3,825,086	.17	3,430,394	.16
Southwestern	12	21	30,300	22,013,737	4,846,358	48,146,423	9.93	801,663	.17	901,335	.18
Eastern	6	9	24,700	15,367,935	3,430,631	35,159,938	10.25	622,264	.18	766,782	.22
Total	28	72	180,700	134,026,894	30,249,542	295,363,072	9.77	5,249,013	.17	5,098,511	.17
1919											
Northwestern	10	42	125,700	108,654,865	24,269,134	250,044,858	10.30	4,911,355	.20	3,691,349	.15
Southwestern	12	23	36,300	28,548,915	6,423,369	62,620,389	9.74	1,336,112	.21	1,353,236	.21
Eastern	6	8	24,300	16,734,327	3,771,229	39,996,530	10.60	900,512	.24	861,008	.23
Total	28	73	186,300	153,938,107	34,463,732	352,661,777	10.23	7,147,979	.21	5,905,593	.17
1920											
Northwestern	10	42	125,700	116,669,107	24,735,134	300,491,027	12.15	6,534,381	.26	5,139,121	.21
Southwestern	12	23	36,300	30,241,394	6,651,923	71,924,025	10.81	1,680,640	.25	1,707,081	.26
Eastern	6	8	24,300	15,230,970	3,353,901	39,143,379	11.67	1,164,833	.35	976,772	.29
Total	28	73	186,300	162,141,471	34,740,958	411,558,431	11.85	9,379,854	.27	7,822,974	.22
1921											
Northwestern	10	43	126,700	105,590,090	22,873,606	195,467,409	8.54	5,746,554	.25	4,451,678	.19
Southwestern	12	24	37,250	27,750,065	6,106,489	49,050,650	8.03	1,564,409	.26	1,602,191	.26
Eastern	6	8	24,300	13,860,346	3,077,084	25,431,505	8.26	847,920	.28	928,286	.30
Total	28	75	188,250	147,200,501	32,057,179	269,949,564	8.42	8,158,883	.25	6,982,155	.22
1922											
Northwestern	10	43	126,700	111,016,411	24,006,567	148,137,011	6.17	4,818,790	.20	4,453,810	.18
Southwestern	12	27	36,300	31,937,196	7,018,910	36,639,310	5.22	1,462,734	.21	1,589,551	.23
Eastern	6	8	24,300	14,928,640	3,296,580	20,779,706	6.30	775,268	.23	970,028	.29
Total	28	78	187,300	157,882,247	34,322,057	205,556,027	5.99	7,056,792	.20	7,013,389	.20
Total 10 years:											
Northwestern				1,117,945,541	246,893,915	1,790,872,696	7.25	39,575,884	.16	31,312,163	.13
Southwestern				254,532,111	56,193,986	399,827,281	7.12	9,471,173	.17	9,729,681	.17
Eastern				161,352,733	35,817,902	267,910,078	7.48	6,896,123	.19	8,056,208	.23
Grand total				1,533,840,385	338,905,803	2,458,610,055	7.25	55,943,180	.17	49,098,052	.14

[1] Includes options and self-rising ingredients.

TABLE 12.—*Annual mill cost per barrel of wheat flour for 28 identical companies, by districts, 1913–1922*—Continued

Year and group	Depreciation		Packages		Other milling expense		Gross mill costs		Feed credit		Net mill costs	
	Amount	Per barrel	Amount	Per barrel	Amount	Per barrel	Amount	Per barrel	Amount	Per barrel	Amount	Per barrel
1913												
Northwestern	$278,050	$0.01	$6,775,141	$0.26	$1,881,071	$0.07	$112,310,724	$4.36	$15,773,535	$0.61	$96,537,189	$3.75
Southwestern	40,436	.01	1,187,768	.27	480,773	.11	20,395,700	4.60	3,255,139	.73	17,140,561	3.87
Eastern	31,000	.01	960,119	.31	381,883	.12	16,337,230	5.33	2,615,009	.85	13,722,221	4.48
Total	349,486	.01	8,923,028	.27	2,743,727	.08	149,043,654	4.49	21,643,683	.65	127,399,971	3.84
1914												
Northwestern	234,592	.01	7,017,833	.27	1,881,447	.07	113,125,290	4.33	18,624,255	.71	94,501,035	3.62
Southwestern	46,279	.01	1,098,757	.26	476,899	.11	18,778,947	4.46	3,482,759	.83	15,296,188	3.63
Eastern	37,350	.01	1,187,097	.33	442,542	.12	18,096,960	5.06	3,296,416	.92	14,800,544	4.14
Total	318,221	.01	9,303,687	.27	2,800,888	.08	150,001,197	4.43	25,403,430	.75	124,597,767	3.68
1915												
Northwestern	198,735	.01	5,404,127	.23	1,727,689	.07	145,468,694	6.12	19,204,453	.80	126,264,241	5.32
Southwestern	55,560	.01	1,124,198	.22	554,451	.10	28,700,922	5.48	4,337,718	.82	24,363,204	4.66
Eastern	34,232	.01	1,195,636	.28	433,906	.10	26,828,548	6.26	3,960,913	.92	22,867,635	5.34
Total	288,527	.01	7,733,961	.23	2,716,046	.08	200,998,164	6.05	27,503,084	.83	173,495,080	5.22
1916												
Northwestern	338,846	.01	7,334,054	.25	2,158,524	.07	158,473,287	5.38	21,546,327	.72	136,926,960	4.66
Southwestern	81,428	.02	1,210,449	.22	561,711	.10	30,235,028	5.49	4,514,565	.82	25,720,463	4.67
Eastern	40,852	.01	1,221,727	.28	475,255	.11	26,585,998	6.20	3,861,601	.90	22,724,397	5.30
Total	461,126	.01	9,766,230	.25	3,195,490	.08	215,294,313	5.49	29,922,493	.76	185,371,820	4.73
1917												
Northwestern	323,624	.01	7,608,449	.32	2,443,468	.10	224,788,864	9.34	30,761,332	1.28	194,027,532	8.06
Southwestern	117,935	.02	1,626,068	.28	713,695	.12	47,924,196	8.31	6,657,434	1.15	41,266,762	7.16
Eastern	50,334	.01	1,321,541	.36	561,378	.15	34,063,794	9.24	4,841,213	1.31	29,222,581	7.93
Total	491,893	.01	10,556,058	.32	3,718,541	.11	306,776,854	9.16	42,259,979	1.26	264,516,875	7.90
1918												
Northwestern	302,847	.01	10,159,592	.46	3,666,579	.17	233,441,209	10.62	27,243,391	1.24	206,197,818	9.38
Southwestern	197,490	.04	2,422,962	.50	758,921	.16	53,228,794	10.98	6,535,303	1.35	46,693,491	9.63
Eastern	148,894	.04	1,878,259	.55	514,428	.15	39,090,565	11.39	4,910,723	1.43	34,179,842	9.96
Total	649,231	.02	14,460,813	.48	4,939,928	.16	325,760,568	10.77	38,689,417	1.28	287,071,151	9.49
1919												
Northwestern	286,226	.02	15,142,333	.62	3,953,769	.16	278,029,890	11.45	33,734,625	1.39	244,295,265	10.06
Southwestern	174,189	.03	3,731,949	.58	1,119,985	.17	70,335,860	10.94	9,862,098	1.53	60,473,762	9.41
Eastern	129,637	.03	2,337,027	.62	559,038	.15	44,783,752	11.87	5,919,895	1.57	38,863,857	10.30
Total	590,052	.02	21,211,309	.62	5,632,792	.16	393,149,502	11.41	49,516,618	1.44	343,632,884	9.97
1920												
Northwestern	290,637	.01	15,552,383	.63	4,660,846	.19	332,668,395	13.45	53,679,149	2.17	278,989,246	11.28
Southwestern	220,874	.03	3,995,649	.60	1,170,328	.18	80,696,597	12.13	12,124,424	1.82	68,574,173	10.31
Eastern	124,845	.04	2,637,559	.78	623,925	.19	44,671,313	13.32	7,004,282	2.09	37,667,031	11.23
Total	636,356	.02	22,185,591	.64	6,455,099	.18	458,038,305	13.18	72,807,855	2.09	385,230,450	11.09
1921												
Northwestern	451,517	.02	9,771,712	.43	4,513,885	.20	220,402,755	9.63	25,283,657	1.10	195,119,098	8.53
Southwestern	182,118	.03	3,095,583	.50	1,138,027	.19	56,632,978	9.27	7,167,976	1.17	49,465,002	8.10
Eastern	158,034	.05	1,476,413	.48	540,701	.18	29,382,859	9.55	3,568,597	1.16	25,814,262	8.39
Total	791,669	.02	14,343,708	.45	6,192,613	.19	306,418,592	9.55	36,020,230	1.12	270,398,362	8.43
1922												
Northwestern	454,232	.02	7,388,940	.31	4,036,981	.17	169,289,764	7.05	20,275,446	.84	149,014,318	6.21
Southwestern	266,104	.04	1,860,646	.26	1,147,963	.16	42,966,308	6.12	6,088,401	.87	36,877,907	5.25
Eastern	148,686	.05	1,293,843	.39	485,398	.15	24,452,929	7.41	3,282,365	.99	21,170,564	6.42
Total	869,022	.02	10,543,429	.31	5,670,342	.17	236,709,001	6.89	29,646,212	.86	207,062,789	6.03
Total 10 years:												
Northwestern	3,159,306	.01	92,154,564	.37	30,924,259	.13	1,987,998,872	8.05	266,126,170	1.08	1,721,872,702	6.97
Southwestern	1,382,413	.02	21,364,030	.38	8,122,753	.14	449,897,331	8.00	64,025,817	1.14	385,871,514	6.86
Eastern	903,864	.03	15,509,220	.43	5,018,454	.14	304,293,947	8.50	43,261,014	1.21	261,032,933	7.29
Grand total	5,445,583	.02	129,027,814	.38	44,065,466	.13	2,742,190,150	8.09	373,413,001	1.10	2,368,777,149	6.99

TABLE 13.—*Monthly average market prices of hard winter wheat, first patent flour, per barrel, in cotton or jute sacks at Kansas City, with index numbers, 1913–1923*

PRICE PER BARREL

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	$3.92	$3.95	$6.25	$5.75	$8.83	$10.10	$10.11	$14.08	$9.24	$6.62	$6.40
February	3.94	3.95	7.02	5.74	8.38	10.25	10.30	12.64	8.95	7.32	6.39
March	3.88	3.98	6.78	5.13	9.30	10.31	10.71	13.00	8.69	7.44	6.44
April	3.99	4.00	6.80	5.20	11.91	10.31	11.94	13.52	7.74	7.56	6.61
May	4.03	4.00	6.68	5.08	14.44	10.38	12.99	14.52	8.22	7.50	6.53
June	4.15	3.98	5.81	4.82	12.84	10.38	12.00	13.88	8.29	7.11	6.08
July	4.10	3.58	5.58	5.14	11.95	10.63	11.11	13.45	7.45	6.99	5.54
August	4.07	4.33	5.54	6.90	12.41	10.24	10.70	12.40	6.99	6.22	5.76
September	4.19	5.37	4.91	7.40	10.73	10.15	10.98	12.54	7.30	6.11	6.05
October	4.01	5.08	4.91	8.08	10.50	10.14	11.56	11.08	6.99	6.38	6.22
November	3.95	4.98	4.98	9.07	10.32	10.21	12.07	9.28	6.54	6.47	6.00
December	3.95	5.19	5.18	8.03	10.00	10.12	13.52	9.19	6.56	6.51	5.91
Annual average	4.02	4.37	5.87	6.37	10.97	10.27	11.50	12.47	7.75	6.85	6.16

INDEX NUMBERS

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	98	96	155	143	220	251	251	350	230	165	159
February	98	98	175	143	208	255	256	314	223	182	159
March	97	99	169	128	231	256	266	323	216	185	160
April	99	100	169	129	296	256	297	336	193	188	164
May	100	100	166	126	359	258	323	361	204	187	162
June	103	99	145	120	319	258	299	345	206	177	151
July	102	89	139	128	297	264	276	335	185	174	138
August	101	108	138	172	309	255	266	308	174	155	143
September	104	134	122	184	267	252	273	312	182	152	150
October	100	126	122	201	281	252	288	276	174	159	155
November	98	124	124	226	257	254	300	231	163	161	149
December	98	129	129	300	249	252	336	229	163	162	147
Annual average	100	109	146	158	273	255	286	310	193	170	153

TABLE 14.—*Monthly average market price of hard spring wheat per 4½ bushels, at Minneapolis, 1913–1923*

PRICE PER 4½ BUSHELS[1]

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	$3.87	$3.96	$6.08	$5.81	$8.64	$9.77	$10.04	$13.59	$7.83	$5.85	$5.54
February	3.95	4.14	6.80	5.76	8.15	9.77	10.08	11.97	7.47	6.71	5.54
March	3.78	4.19	6.62	5.13	8.91	9.77	10.62	12.42	7.29	6.80	5.54
April	3.96	4.10	6.93	5.49	10.71	9.77	11.61	13.64	6.53	7.07	5.76
May	4.10	4.23	7.11	5.45	13.41	9.77	11.84	13.95	6.71	7.11	5.63
June	4.14	4.10	5.81	5.00	12.11	9.77	11.16	13.14	6.93	6.53	5.13
July	4.05	4.05	6.26	5.27	11.61	9.99	11.97	12.83	6.62	6.39	4.91
August	3.96	4.82	4.41	6.71	12.56	9.99	11.75	11.61	6.26	5.31	5.18
September	3.87	5.13	4.41	7.25	9.99	9.99	11.39	11.30	6.71	4.95	5.31
October	3.78	4.95	4.55	7.92	9.77	9.99	11.79	9.54	5.90	5.13	5.31
November	3.83	5.22	4.59	8.69	9.77	9.99	12.87	7.79	5.67	5.40	5.00
December	3.87	5.36	5.09	7.92	9.77	9.99	13.95	7.56	5.76	5.63	5.00
Annual average	3.92	4.50	5.72	6.35	10.44	9.90	11.61	11.61	6.66	6.08	5.32

INDEX NUMBERS

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
January	99	101	155	148	220	249	256	347	200	149	141
February	101	106	173	147	208	249	257	305	191	171	141
March	96	107	169	131	227	249	271	317	186	173	141
April	101	105	177	140	273	249	296	348	167	180	147
May	105	108	181	139	342	249	302	356	171	181	144
June	106	105	148	128	309	249	285	335	177	167	131
July	103	103	160	134	296	255	305	327	169	163	125
August	101	123	113	171	320	255	300	296	160	135	132
September	99	131	113	185	255	255	291	288	171	126	135
October	96	126	116	202	249	255	301	243	151	131	135
November	98	133	117	222	249	255	328	199	145	138	128
December	99	137	130	202	249	255	356	193	147	144	128
Annual average	100	115	146	162	266	253	296	296	170	155	136

[1] Wheat equivalent of a barrel of flour.

TABLE 15.—*Retail price of bread (in cents) per 1-pound loaf, in 24 principal cities, 1919–1923*

[Prices in effect on the 15th day of each month, compiled from reports of the United States Bureau of Labor Statistics]

Month	Boston	New York	Philadelphia	Baltimore	Washington	Richmond	Charleston, S. C.	Atlanta	Jacksonville	New Orleans	Houston	Memphis
1919												
January	9.1	10.0	9.4	9.7	10.1	10.0	10.0	10.0	10.0	9.2	9.1	10.0
February	9.1	10.0	9.4	9.7	10.1	10.0	10.0	10.0	10.0	9.2	8.8	10.0
March	9.2	10.0	9.4	9.6	10.1	10.0	10.0	9.5	10.0	9.2	8.9	10.0
April	9.2	10.0	9.4	9.6	10.1	10.0	10.0	10.0	10.0	9.1	8.9	10.0
May	9.5	10.0	9.4	9.6	10.1	10.4	10.0	10.0	10.0	9.2	8.9	10.0
June	9.5	10.0	9.4	9.6	10.1	10.9	10.0	10.0	10.0	9.2	8.9	10.0
July	9.5	10.0	9.4	9.6	10.1	10.9	10.0	10.0	10.0	9.2	8.9	10.0
August	9.6	10.0	9.4	9.6	10.1	10.9	10.0	10.0	10.0	9.1	8.8	10.0
September	9.7	10.0	9.4	9.6	10.1	10.9	10.0	10.0	10.0	9.1	8.9	10.0
October	9.6	10.0	9.4	9.6	10.1	10.6	10.0	10.0	10.0	9.2	9.2	10.0
November	9.7	10.0	9.4	9.6	10.1	11.1	10.0	10.0	10.0	9.2	9.2	10.0
December	9.6	10.0	9.4	9.6	10.1	10.9	10.0	10.0	10.0	9.1	9.2	10.0
Average	9.4	10.0	9.4	9.6	10.1	10.6	10.0	10.0	10.0	9.2	9.0	10.0
1920												
January	11.3	10.5	9.6	10.1	10.2	11.6	10.6	11.1	10.7	10.0	10.2	11.0
February	11.2	11.1	9.8	10.2	10.1	12.3	10.6	11.0	10.7	10.0	10.3	11.3
March	11.2	11.1	9.8	10.2	10.6	12.7	11.5	12.2	11.0	10.1	10.2	12.1
April	11.3	11.6	9.8	11.0	10.6	12.7	11.5	11.5	10.9	10.1	10.2	12.3
May	11.3	11.8	10.6	11.3	12.2	12.8	11.5	11.5	11.9	10.1	10.3	12.5
June	11.3	11.9	10.6	11.4	12.3	13.0	13.2	12.2	12.5	10.4	10.2	12.9
July	11.3	11.9	10.6	11.4	12.3	13.1	13.6	12.7	12.7	10.4	10.5	12.9
August	11.3	11.9	10.6	11.4	12.1	13.2	13.6	12.8	12.7	10.4	10.3	13.1
September	11.4	11.9	10.6	11.4	12.2	13.2	13.6	12.8	12.3	10.5	10.3	13.2
October	11.4	11.9	10.6	10.8	12.0	13.1	13.2	12.8	12.2	10.7	10.3	13.5
November	11.4	11.9	10.6	10.8	12.0	12.8	12.9	12.3	12.2	10.5	10.2	13.3
December	10.4	11.6	9.7	10.8	10.4	11.1	12.8	12.3	11.7	9.6	9.6	12.9
Average	11.2	11.7	10.2	10.9	11.4	12.6	12.4	12.1	11.8	10.2	10.2	12.6
1921												
January	10.5	11.0	9.6	10.8	10.5	11.1	11.6	12.3	11.5	9.7	9.1	12.1
February	10.5	10.7	9.6	10.8	10.5	11.1	11.6	12.2	11.5	9.7	9.1	11.3
March	10.5	10.8	9.6	10.4	10.6	11.1	11.6	11.9	11.3	9.5	9.0	11.3
April	10.0	10.6	9.6	9.9	10.5	10.8	11.6	11.5	10.4	9.3	8.9	10.1
May	9.9	9.9	9.0	9.2	10.5	10.7	11.4	11.1	10.4	8.5	8.9	10.1
June	9.9	10.0	9.0	9.2	10.2	10.7	11.3	11.1	10.4	8.3	8.7	10.3
July	9.9	10.1	8.7	9.2	10.2	10.7	11.1	10.9	10.3	8.2	8.7	10.3
August	9.9	10.2	8.7	9.2	10.2	10.7	10.9	10.9	10.3	8.2	8.6	10.3
September	9.9	10.1	8.7	8.5	10.2	10.7	10.8	10.9	10.4	8.1	8.5	10.3
October	9.9	10.1	8.7	8.6	10.2	10.7	10.8	10.9	10.4	8.1	8.5	10.3
November	9.9	10.0	8.7	8.6	8.1	10.6	10.8	9.9	10.4	8.1	8.5	9.7
December	9.4	9.9	8.7	8.6	7.9	10.6	10.3	10.0	10.4	8.1	8.4	9.6
Average	10.0	10.3	9.1	9.4	10.0	10.8	11.2	11.1	10.6	8.7	8.7	10.5
1922												
January	8.8	9.8	8.8	8.6	8.6	9.1	9.8	10.1	10.4	8.0	7.1	9.2
February	8.5	9.0	8.8	8.6	8.6	9.1	9.5	10.1	10.4	8.0	7.0	9.3
March	8.5	8.9	8.7	8.6	8.6	9.1	9.5	10.1	10.4	8.1	7.0	9.0
April	8.5	8.9	8.7	8.6	8.6	9.1	9.5	10.0	10.4	8.1	7.0	9.2
May	8.5	8.9	8.7	8.6	8.6	9.1	9.5	10.0	10.7	8.1	7.0	9.2
June	8.5	9.7	8.7	8.6	8.7	9.1	9.5	10.0	10.7	8.0	6.8	9.2
July	8.5	9.7	8.7	8.6	8.7	9.2	9.6	10.0	10.7	7.8	6.8	9.3
August	8.5	9.7	8.7	8.6	8.7	9.1	9.6	9.8	10.6	7.7	6.9	9.1
September	8.5	9.8	8.7	8.5	8.5	9.1	9.6	9.6	10.6	7.7	6.6	9.0
October	8.4	9.8	8.6	8.1	8.5	9.1	9.7	9.6	10.6	7.7	6.6	9.0
November	8.4	9.8	8.5	8.3	8.5	9.2	9.5	9.6	10.6	7.6	6.6	9.0
December	8.4	9.7	8.5	8.4	8.5	9.2	9.4	9.6	10.6	7.7	6.6	9.1
Average	8.5	9.5	8.7	8.5	8.6	9.1	9.6	9.9	10.6	7.9	6.8	9.1
1923												
January	8.4	9.7	8.5	8.4	8.2	9.1	9.5	9.1	10.6	7.7	7.2	9.1
February	8.4	9.7	8.5	8.4	8.2	9.1	9.5	9.1	10.6	7.7	7.2	9.0
March	8.4	9.7	8.5	8.4	8.2	9.1	9.5	9.1	10.2	7.7	7.2	9.0
April	8.4	9.6	8.4	8.4	8.2	9.2	9.5	9.2	10.2	7.7	7.2	9.0
May	8.4	9.6	8.4	8.4	8.2	9.2	10.2	9.2	10.3	7.7	7.2	9.0
June	8.4	9.6	8.4	8.5	8.4	9.2	10.2	9.2	10.3	7.7	7.2	9.2
July	8.4	9.6	8.4	8.7	9.0	8.8	10.2	9.2	10.3	7.6	7.1	8.9
August	8.4	9.6	8.4	8.8	9.0	8.7	10.3	9.2	10.3	7.6	7.1	8.9
September	8.4	9.6	8.4	8.7	9.0	8.7	10.2	9.1	10.3	7.6	7.1	8.9
October	8.4	9.6	8.4	8.8	9.0	8.6	10.2	9.1	10.3	7.6	7.1	9.2
November	8.4	9.6	8.4	8.8	9.0	8.6	10.2	9.1	10.3	7.6	7.1	9.1
December	8.4	9.6	8.4	8.8	9.0	8.6	10.2	9.1	10.3	7.6	7.1	9.0
Average	8.4	9.6	8.4	8.6	8.6	8.9	10.0	9.1	10.3	7.7	7.2	9.0

TABLE 15.—*Retail price of bread (in cents) per 1-pound loaf, in 24 principal cities, 1919–1923*—Continued.

Month	Kansas City	St. Louis	Indianapolis	Chicago	Minneapolis	Omaha	Denver	Salt Lake City	Los Angeles	San Francisco	Portland, Oreg.	Seattle
1919												
January	9.3	10.0	9.9	10.2	9.2	10.0	11.9	10.0	8.9	10.0	9.9	10.6
February	9.3	10.0	9.9	10.2	9.2	10.0	11.8	10.0	8.9	10.0	9.8	10.6
March	10.0	10.0	9.5	10.2	9.2	10.0	11.3	10.0	8.9	10.0	9.9	10.3
April	10.0	10.0	9.5	10.0	9.2	10.0	11.3	10.0	8.9	10.0	9.9	10.2
May	10.0	10.0	9.5	10.0	9.2	10.0	11.5	10.0	9.3	10.0	9.9	10.9
June	10.0	10.0	9.7	10.0	9.6	10.0	11.4	10.0	9.4	10.0	9.9	10.9
July	10.0	10.0	9.7	10.0	9.6	10.0	11.2	10.0	9.4	10.0	9.9	10.9
August	10.0	10.0	9.7	10.0	9.6	10.0	11.7	10.0	9.4	10.0	9.9	11.7
September	10.0	10.0	9.7	10.0	9.6	10.0	11.2	10.0	9.4	10.0	9.9	11.5
October	10.0	10.0	9.7	10.7	9.6	10.0	11.2	10.0	9.4	10.0	9.9	11.5
November	10.0	10.0	9.7	10.6	9.6	10.0	11.2	10.0	9.7	11.7	10.6	11.5
December	10.0	10.0	9.7	10.7	9.8	10.0	11.0	10.0	10.0	11.7	10.6	11.5
Average	9.9	10.0	9.7	10.2	9.5	10.0	11.4	10.0	9.3	10.3	10.0	11.0
1920												
January	11.6	11.4	9.7	10.6	10.6	11.6	11.6	12.1	9.6	10.9	10.5	11.5
February	12.2	11.7	10.7	11.6	10.5	12.0	11.7	12.1	9.6	10.9	10.5	11.7
March	12.1	11.7	10.7	11.6	10.4	12.1	11.8	12.2	9.6	10.9	10.5	11.6
April	12.4	11.8	10.7	11.6	10.4	12.1	12.0	12.3	9.6	10.9	10.5	11.5
May	12.4	12.4	11.6	12.3	10.4	12.2	11.9	12.4	9.9	10.9	10.5	11.5
June	12.8	12.7	11.6	12.4	11.1	12.4	12.1	12.5	10.6	10.9	11.4	11.5
July	13.2	12.8	11.6	12.4	11.1	12.2	12.2	12.6	10.6	10.9	11.3	11.5
August	13.4	13.1	11.6	12.4	11.1	12.2	12.2	12.6	10.6	10.9	11.3	11.5
September	13.0	12.1	11.6	12.4	11.1	12.1	12.2	12.6	10.6	10.9	11.3	11.5
October	12.6	12.1	11.6	12.4	11.1	11.6	12.1	12.4	10.6	10.9	11.3	11.5
November	12.1	12.0	11.6	12.4	10.3	11.5	11.4	12.2	9.7	10.9	10.4	11.4
December	11.9	11.4	10.1	11.5	10.3	11.5	10.7	11.8	9.7	10.1	10.3	10.1
Average	12.5	12.1	11.1	12.0	10.7	12.0	11.8	12.3	10.1	10.8	10.8	11.4
1921												
January	11.9	11.4	10.1	11.3	10.3	11.5	10.9	11.8	9.7	9.6	10.3	10.0
February	11.4	11.2	10.1	11.3	10.3	11.5	10.8	11.8	9.7	9.6	9.7	10.0
March	11.4	11.2	9.8	11.3	10.3	11.8	10.8	11.8	9.7	9.6	9.5	10.0
April	11.4	10.6	9.5	11.2	10.3	11.8	10.7	10.3	9.4	9.6	9.5	10.0
May	10.7	10.6	9.2	9.9	9.6	11.1	10.3	9.8	9.2	9.6	9.5	9.9
June	9.8	10.6	8.6	9.9	9.6	11.1	10.3	9.8	9.2	9.6	9.5	9.9
July	9.9	10.6	8.6	9.8	9.6	9.8	10.3	9.8	9.2	9.6	9.5	9.9
August	9.9	10.1	8.6	9.8	9.6	9.8	10.1	9.8	9.2	9.6	9.5	9.9
September	9.8	10.1	8.6	9.8	8.6	9.9	10.2	9.8	9.2	9.6	9.5	9.9
October	9.7	9.7	8.6	9.8	8.6	10.5	10.0	9.8	9.2	9.3	9.5	9.8
November	9.7	9.6	8.6	9.8	8.4	10.0	10.0	9.8	9.2	8.5	8.4	8.2
December	9.6	9.5	8.6	9.8	8.4	10.0	9.7	9.6	9.2	8.5	8.4	8.1
Average	10.4	10.4	9.1	10.3	9.5	10.7	10.3	10.3	9.3	9.4	9.4	9.6
1922												
January	9.7	9.4	8.6	9.9	8.4	10.0	8.3	9.6	9.0	8.5	8.4	7.5
February	6.4	9.6	8.6	8.9	8.4	9.8	8.2	9.4	9.0	8.5	8.4	8.1
March	6.9	9.6	8.1	9.7	8.4	9.8	8.2	9.4	9.0	8.5	9.3	8.2
April	8.1	9.3	8.1	9.7	8.8	9.8	8.2	9.4	9.0	8.5	9.3	9.9
May	7.7	9.4	8.1	9.7	8.9	9.8	8.2	9.4	9.1	8.5	9.4	9.9
June	7.8	9.3	8.1	9.7	9.0	9.8	8.2	9.5	9.1	8.5	9.4	9.9
July	7.8	9.3	8.0	9.7	9.0	9.8	8.4	9.4	9.0	8.5	9.4	9.9
August	7.9	9.0	7.3	9.7	9.0	9.9	8.4	9.5	9.0	8.5	9.4	9.9
September	7.9	9.0	7.3	9.7	9.0	9.8	8.4	9.5	9.0	9.1	9.4	9.9
October	7.9	9.0	7.3	9.7	9.0	9.8	8.3	9.5	9.0	9.1	9.4	[illegible]
November	7.9	8.9	7.8	9.7	9.0	9.8	8.2	9.4	9.0	9.0	9.4	8.6
December	7.9	8.9	7.3	9.7	9.0	9.8	8.2	9.4	8.8	9.0	9.4	8.6
Average	7.8	9.2	7.9	9.7	8.8	9.8	8.3	9.5	9.0	8.7	9.2	9.2
1923												
January	8.2	8.9	8.4	9.7	9.0	9.9	8.2	9.8	8.8	9.0	9.4	8.6
February	8.2	8.9	8.4	9.7	9.0	9.8	8.2	9.6	8.8	9.0	9.4	8.6
March	8.2	8.9	8.4	9.7	9.0	9.8	8.2	9.5	9.0	9.0	9.4	8.6
April	8.2	8.9	8.5	9.7	9.0	9.8	8.2	9.7	9.0	9.0	9.4	9.9
May	8.1	8.9	8.5	9.7	9.0	9.8	8.2	9.5	9.0	9.0	9.4	9.9
June	8.1	8.9	8.5	9.7	9.0	9.8	8.2	9.6	9.0	9.1	9.4	9.9
July	8.1	8.9	8.5	9.7	9.0	9.8	8.1	9.6	9.0	9.1	9.4	9.9
August	7.9	8.9	8.5	9.7	9.0	9.8	7.8	9.8	9.0	9.2	9.2	9.9
September	7.9	8.9	8.5	9.7	9.0	9.8	7.8	9.8	9.0	9.2	9.2	9.9
October	7.9	8.9	8.5	9.8	9.0	9.8	7.8	9.8	9.0	9.2	9.2	9.9
November	8.0	8.9	8.5	9.8	9.0	9.9	7.8	9.8	9.0	9.2	9.2	9.9
December	8.2	8.9	8.5	9.7	9.0	9.8	7.8	9.8	9.0	9.2	9.2	9.9
Average	8.1	8.9	8.5	9.7	9.0	9.8	8.0	9.6	9.0	9.1	9.3	9.6

EXHIBITS

EXHIBIT 1

MILLERS' NATIONAL FEDERATION FLOUR PACKAGE DIFFERENTIALS

(Effective December 16, 1922)

[Basis, 98-pound cotton]

Kind	Weight	Charge over bulk price for packing in buyer's sacks
Wood:	*Pounds*	
$0.55 over basis	196	----------
$1.40 over basis	98	----------
Jute:		
$0.10 under basis	140	----------
Same as basis (2 to barrel)	98	----------
Cotton:		
Basis (2 to barrel)	98	----------
$0.10 under basis (2 to barrel)	96	----------
$0.20 over basis (4 to barrel)	49	$0.10
$0.10 over basis (4 to barrel)	48	.10
$0.40 over basis (8 to barrel)	24½	.10
$0.30 over basis (8 to barrel)	24	.10
$0.60 over basis (16 to barrel)	12½	.15
$0.50 over basis (16 to barrel)	12	.15
$0.90 over basis (20 to barrel)	10	.20
Do	9.8	.20
$0.90 over basis (24 to barrel)	8	.25
$1 over basis (28 to barrel)	7	.30
$1 over basis (32 to barrel)	6	.30
$1.50 over basis (40 to barrel)	5	.40
Do	4.9	.40
$1.50 over basis (48 to barrel)	4	.45
$1.70 over basis (56 to barrel)	3½	.50
$1.80 over basis (64 to barrel)	3	.55
$2.70 over basis (96 to barrel)	2	.70
Paper:		
Same as basis (4 to barrel)	49	.10
$0.10 under basis (4 to barrel)	48	.10
$0.10 over basis (8 to barrel)	24½	.15
Same as basis (8 to barrel)	24	.15
$0.30 over basis (16 to barrel)	12½	.20
$0.20 over basis (16 to barrel)	12	.20
$0.60 over basis (20 to barrel)	10	.25
$0.30 over basis (24 to barrel)	8	.30
$0.50 over basis (28 to barrel)	7	.30
$0.50 over basis (32 to barrel)	6	.35
$0.90 over basis (40 to barrel)	5	.50
$0.70 over basis (48 to barrel)	4	.50
$1 over basis (56 to barrel)	3½	.55
$1 over basis (64 to barrel)	3	.55
$1.60 over basis (96 to barrel)	2	.80

Outside jute envelopes (1 to barrel), 20 cents per barrel additional.
Outside jute envelopes (2 to barrel), 30 cents per barrel additional.
Outside cotton envelopes (2 to barrel), 35 cents per barrel additional.
Outside paper envelopes (4 to barrel), 30 cents per barrel additional.

All sales to be made basis 98-pound cotton.

A reduction of 25 cents per barrel from the half-cotton basing price shall be made where the flour is packed in buyer's 98-pound bags and a reduction of 15 cents per barrel from the 140-pound jute price where the flour is packed in buyer's 140-pound jute bags.

Seller or buyer may not have option of shipping flour in cotton or jute sacks where either may have been specified at time of sale, except as may be agreed to by buyer and seller at time of shipment.

Exhibit 2

STATE LAWS REQUIRING THE WEIGHT CONTENTS TO BE MARKED ON FLOUR AND FEED PACKAGES

Alabama.—Flour: Net contents must be stated on the labels of containers.[1]

Arizona.—Flour: Weight must be stamped on package.[1]

Arkansas.—Flour: True weight must be marked or stamped on package.[1]

California.—Flour: Net weight must be plainly and conspicuously marked, branded, or otherwise indicated on the outside or top of package or on a label or tag attached thereto.[1]

Colorado.—Flour and feed: Weight, if stated must be plainly and correctly marked on outside of package.[2]

Connecticut.—Flour: True net weight must be marked on package.[1]

Delaware.—Flour: Correct and exact weight must be marked or printed prominently, distinctly, and conspicuously on bag or package.[1]

Florida.—Flour: Weight must be plainly and conspicuously marked on the outside of the covering or container usually delivered to consumer. Feed: Packages must have a tag or label attached showing the net weight contents.

Georgia.—Flour: Net weight must be plainly marked on outside of package.[1]

Idaho.—Flour and feed: No State regulations.[2]

Illinois.—Flour: Net weight must be plainly and conspicuously marked on outside of package.[1]

Indiana.—Flour: Net weight must be stated on each package. Feed: Net weight must be shown on a tag or label affixed to package.

Iowa.—Flour: Same as Indiana. Feed: Net weight must be shown on package or on a tag attached thereto.

Kansas.—Flour: Same as Georgia. Feed: Same as Iowa.

Kentucky.—Flour: No State regulation.[2] Feed: Net weight must be shown on package.

Louisiana.—Flour: Same as Arkansas.[1]

Maine.—Flour: Weight must be plainly marked on package.[1]

Maryland.—Flour: Weight contents must be plainly and conspicuously marked on outside of package. Feed: Same as Iowa.

Massachusetts.—Flour: Same as Illinois. Feed: Same as Iowa.

Michigan.—Flour: Correct weight must be plainly printed or stamped on face of label. Feed: Same as Iowa.

Minnesota.—Flour: No State regulation.[2] Feed: Same as Iowa.

Mississippi.—Flour: Same as Maryland. Feed: Net weight must be stated on a tag or label, in a conspicuous place on outside of package, lot, or parcel.

Missouri.—Flour: Weight must be plainly labeled or stamped on package. Feed: Same as Kentucky.

Montana.—Flour and feed: No State regulation.[2]

Nebraska.—Flour: Correct weight of contents must be clearly printed on outside of package. Feed: Same as Iowa.

Nevada.—Flour: Correct net weight must be shown on label.[1]

New Hampshire.—Flour: No State regulation.[2] Feed: Net weight must be plainly and conspicuously stated on outside of package.

New Jersey.—Flour: Same as Illinois. Feed: Same as Iowa.

New Mexico.—Flour: True weight must be plainly marked, branded, or stenciled on outside of package.[1]

New York.—Flour: Same as Indiana. Feed: Same as Iowa.

North Carolina.—Flour: Same as Indiana. Feed: Weight must be shown on package or on a tag attached thereto.

North Dakota.—Flour: Weight contents must be plainly and conspicuously marked on outside of container or on the covering of package usually delivered to the consumer. Feed: Same as Iowa.

Ohio.—Flour: Must have exact weight plainly marked on package. Feed: Same as Iowa.

Oklahoma.—Flour: Same as Maryland. Feed: Net weight must be shown on a tag affixed to each bag or package.

Oregon.—Flour: Same as Maryland. Feed: Same as Iowa.

Pennsylvania.—Flour: Same as Maryland. Feed: Same as Iowa.

Rhode Island.—Flour: Weight must be plainly and correctly marked on outside of package. Feed: Statement of the net weight must be plainly printed and affixed in a conspicuous place on outside of package.

South Carolina.—Flour: Net weight must be plainly marked or otherwise indicated on outside of package or on a label or tag attached thereto. Feed: Same as North Carolina.

South Dakota.—Flour and feed same as Illinois.

Tennessee.—Flour: Weight must be conspicuously, plainly, and correctly marked on outside of package. Feed: Net weight must be printed on or affixed to package.

Texas.—Flour and feed: Same as Illinois.

Utah.—Flour and feed: Same as Illinois.

Vermont.—Flour: Correct net weight must be plainly and conspicuously marked on outside of package. Feed: Same as Iowa.

Virginia.—Flour: Same as Vermont. Feed: Same as Tennessee.

Washington.—Flour: Same as Colorado.[2] Feed: Net weight of package must be stated on a tag or label.

West Virginia.—Flour: Same as Illinois. Feed: Same as Iowa.

Wisconsin.—Flour: Actual weight must be plainly and conspicuously marked on outside of package. Feed: Same as Iowa.

Wyoming.—Flour and feed: Same as Indiana.

District of Columbia.—Flour and feed: No regulations.[2]

Regarding the term "food" as used in the Federal food and drugs act, section 6 of this act provides as follows:

"Sec. 6. * * * The term 'food,' as used herein, shall include all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound."

Exhibit 3

[H. R. 3241, Sixty-eighth Congress, first session]

In the House of Representatives, December 13, 1923. Mr. Vestal introduced the following bill; which was referred to the Committee on Coinage, Weights, and Measures and ordered to be printed.

A BILL To establish the standard of weights and measures for the following wheat-mill, rye-mill, and corn-mill products, namely, flours, hominy, grits, and meals, and all commercial feeding stuffs, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the standard of weights for the following wheat-mill, rye-mill, and corn-mill products, namely, flours, hominy, grits, and meals, and all commercial feeding stuff, shall be one hundred pounds avoirdupois, and the standard measure for such commodities, when the same are packed for sale, shipped, sold, or offered for sale in packages of five pounds or over, shall be a package containing net avoirdupois weight one hundred pounds, or a multiple of one hundred pounds, or one of the following fractions thereof, five, ten, twenty-five, or fifty pounds; and, in addition, for wheat flour, rye flour, and corn flour only, one hundred and forty pounds; and for commercial feeding stuffs only, sixty or eighty pounds; each of which packages shall bear a plain, legible, and conspicuous statement of the net weight contained therein.

Sec. 2. That the standard packages for the following wheat-mill, rye-mill, and corn-mill products, namely, flours, hominy, grits, and meals, and all commercial feeding stuffs, when the same are packed, shipped, sold, or offered for sale in packages of five pounds or over, shall be those containing net avoirdupois, weight one hundred pounds, or multiples of one hundred pounds, or the following fractions thereof, five, ten, twenty-five, and fifty pounds; and, in addition, for wheat flour, rye flour, and corn flour only, one hundred and forty pounds; and for commercial feeding stuffs only, sixty and eighty pounds.

Sec. 3. That it shall be unlawful for any person, firm, corporation, or association to pack or cause to be packed for sale, to ship or offer for shipment, or

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[1] A similar requirement applies also to packages for commercial feeding stuffs.

[2] No regulation other than the Federal food and drugs act, which applies to all packages of food shipped in interstate commerce. This act provides that all articles of food, or articles entering into the composition of food, if in package form, offered for interstate shipment or otherwise coming within the jurisdiction of the act, must, when offered for shipment, be plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count. Provided, however, that reasonable variations shall be permitted, and tolerances and also exemptions as to small packages shall be established by rules and regulations made in accordance with the provisions of the act.

to sell or offer for sale the following wheat-mill, rye-mill, or corn-mill products, namely, flours, hominy, grits, and meals, or any commercial feeding stuffs, in packages of five pounds or over, which, when in original unbroken package form, shall not be one of the standard measures established in section 2 hereof, and bear a plain, legible, and conspicuous statement of the net weight contained therein; and any person, firm, corporation, or association guilty of a violation of the provisions of this act shall be deemed guilty of a misdemeanor and be liable to a fine not exceeding $500. By the term "original unbroken package form," as used in this act, is meant any form of original package or carton or other container made or prepared to contain products for sale in such original package or other container, and purporting to contain any specific weight or measure: *Provided*, That sale of irregular broken lots by actual weight shall not be unlawful.

SEC. 4. That the provisions of this act shall not apply to packages of the following wheat-mill, rye-mill, or corn-mill products, namely, flours, hominy, grits, or meals, or any commercial feeding stuffs, when intended for export to any foreign country, and packed according to the specifications or directions of the foreign purchaser, agent, or consignee; but if said wheat-mill, rye-mill, or corn-mill products, namely, flours, hominy, grits, or meals, or any commercial feeding stuffs shall, in fact, be sold or offered for sale for domestic use or consumption, then this exception shall not exempt said articles from the operation of any of the other provisions of this act: *Provided, however*, That when packages of said wheat-mill, rye-mill, or corn-mill products, namely, flours, hominy, grits, or meals, or any commercial feeding stuffs, originally intended for export, have been packed in the packages customarily used in any foreign country, and it becomes necessary to offer these for sale or to sell them for domestic use or consumption, then such export packages may be sold for domestic use or consumption by special contract, if approved by the Secretary of Agriculture.

SEC. 5. That rules and regulations necessary for the enforcement of this act not inconsistent with the provisions hereof, shall be made by the Secretary of Agriculture, and said rules and regulations shall include reasonable variations or tolerances which may be allowed.

SEC. 6. That it shall be the duty of each district attorney to whom satisfactory evidence of any violation of this act is presented to cause proper proceedings to be instituted and prosecuted in a United States court having jurisdiction of such offense.

SEC. 7. That this act shall not be construed as repealing the act of July 28, 1866 (chapter 301, Revised Statutes of the United States, sections 3569 and 3570), authorizing the use of the metric system, but such sections shall not be construed as allowing the packing, shipping, or offering for shipment, the sale or offering for sale of packages of any size other than those established as standards herein.

SEC. 8. That this act shall be in force and effect one year from and after the passage of this act.

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